Physics

Part II

2014-03
www.u5d.net

CONTENT   *Page*

Quantum physics I
— *some annotations* —

Quantum mechanics:

Some possible aspects from the viewpoint
of this 5-dimensional model ?

Most recent reference, David Lindley (referred to below as (L): *"Where does the weirdness go? : why quantum mechanics is strange, but not as strange as you think",* 1996. Swedish version 2002.

Quantum physics, incompatible with classical physics, includes e.g.

- the double nature of quanta as particles and waves,

- the influence of measurements on the results (or "reality"),

- wave functions of squared amplitudes as probabilities which "collapse" to certainty through a measurement,

- the principle of the indefinable (Heisenberg), position and velocity (or momentum) not possible to define exactly with the same measurement,

- experimental results that seem to show "immediate effects" between separate quanta (effects faster than light), and

- fundamental polarizations in opposites which do not agree with classical physics (as directions of polarization of photons passing through a magnetic field).

Physicists still seem to have problems, not mathematical but philosophical or rather conceptual (?), with these results.

Annotations:

1) 4th dimension degree:*

Perhaps the most central source for physicists' difficulties to interpret the results of their experiments is their fundamental view of the 4-dimensional reality: 3 dimensions for the space, and Time as one (1): 3-2-1-0 in their mathematics.
   With the 5-dimensional model here and the 4th dimension degree identified as "all-directed" and outwards/inwards as the only relation, we have quite another starting point for the interpretation of "uncertainties" or the "indefinable", the dependence of results on the measurements and so on.

2) **Direction in a more narrow sense** has of course to be identified - sooner defined - in relation to something else, outside the center, the particle or quantum as such. This thing in the environment as anticenter can be the measurement apparatus.
   Direction, in 4th dimension degree (shortening "d-degree") is in this model seen as stepwise crystallized towards one-way direction through dimension steps.

Is it correct to call it an inherent "indeterminism" as L. does, leaving us as he thinks with the possibility of a "free will"? From the viewpoint of a center there is a direction determined as "outwards". The definition is quite enough for me as a center in 4th dimension degree, in an empty environment.

As soon as you show up in the North, it's you that decides my direction northwards, a closer determination. There is most of a "free will" in the center: but it doesn't will or want anything (but possibly outwards) until the surroundings is met and taken into account and defines and structures its content.

3) The uncertainty principle:

One thing is that higher d-degrees always represent uncertainties in relation to the lower ones: a volume contains an infinity of surfaces, a surface an infinity of lines. a line an infinity of points: Which one to choose in a d-degree step will certainly depend on the surrounding.

Some examples of this principle is rather hard to understand as difficulties.
   In Stern-Gerlach experiments where electrons pass vertical magnetic field instruments, they come out with spin Up or Down. *L.* seems to find it a big problem that it, in this same measurement, is impossible then to know if the electrons have spin Right or Left. This second information needs a new horizontal magnetic field measurement.
   We don't know much about a person before we meet her and talk with her and so on, establish some relation. And different situations can lead to different behavior of that person, naturally.
   Another thing: for a particle along a horizontal x-axis the plus-direction could be "up" and the minus direction "down". In its own right as a center, why should the particle bother about our own external reference to a gravitational field?
   More about the uncertainty in point 4 below and 6.

4) Wave-functions and their "collapses":
Schrödinger's wave-functions (from 1926), telling only about probabilities (for example to find an electron at a certain position), collapses into certainty: "yeas" or "no", when a measurement is done.
   When there is a knock on our door, we can be in real uncertainty. When the person enters, the uncertainty may collapse to a "negative" or "positive" reaction or perhaps Zero. Some persons, as Buddhists perhaps, can reach a state of empty minds in solitude, but find their minds collapsing into definite word quanta when addressed by someone else.

On the level of theoretical physics, wave-functions which collapse could be identified with what in this model is thought of as d-degree steps or quantum jumps:
Simply illustrated:
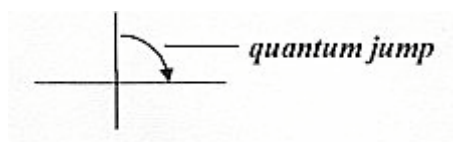
Or take a more concrete situation: If we follow a wall (or are creeping on it as a fly), a wall as a 2-dimensional uncertainty, and follow it horizontally, we suddenly notice it collapses to a corner, a vertical, 1-dimensional something. Of course we don't know anything about the height of the wall then. Still, with our theoretical knowledge about walls in ordinary rooms we conclude that there must be an opposite corner.
   Following the wall vertically we arrive to a new "collapse", a 1-dimensional "border"

or corner, in reality facing towards a 3rd dimension degree, a ceiling or a floor.
On a wall everything is uncertain, not defined, as up-down, left-right until we reach the boundary line to a new dimension degree.

   (If this view on wave-functions and collapses would be sustainable, it should imply, according to the model here, that the property "Mass" could be interpreted in terms of "collapses" of vector fields.)

Figure: Suggested identifications of physical qualities in this model
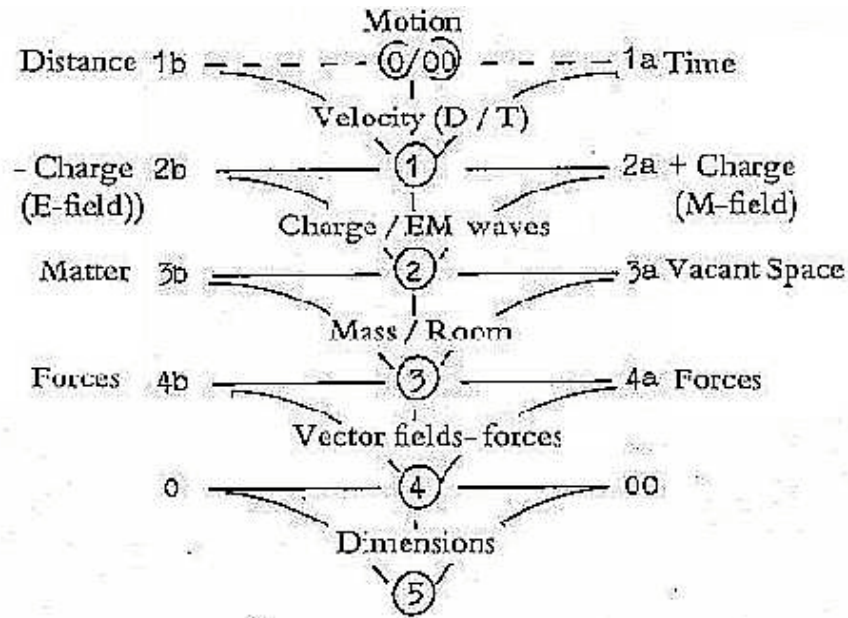
5) Polarizations in opposites:

This principle became a fundamental part of quantum physics through the Stern-Gerlach experiments 1921 (*L*). They had expected the electrons to leave the magnets in scattered directions, but only got UP or DOWN, RIGHT or LEFT. Classical physics couldn't explain that.

   These polarizations in complementary opposites happen to be the fundamental structuring principle in this 5-dimensional model too, yet not with origin in quantum physics. As soon as we have a center, we have the same principle in the opposites "center - anticenter", "outwards - inwards", with gravitation we have "up and down", we have negative - positive acceleration, opposite charges, kernels - shells, backwards - forwards in relative directions and motions etc.

   In this model, or conceptual structure, different polarization types occur in different d-degrees, which could agree with the view on wave collapses as d-degree steps above.

We could say that polarization is the principle of a "**potential**", created by in inner "force" in relation to an external "force".

Still, among the first hypotheses in the model here we have presumed that d-degree steps also represent angle steps and give different angles between the complementary poles of the potential. In the experiments referred to the opposition is 180°, presumed to be the angle in 4th d-degree. In relation to direction of the magnetic field however, it seems to be orthogonal or 90°, the presumed angle in 3rd d-degree. (Cf. about E- and M-fields.). And an individual 1-dimensional line in each potential of higher degrees could be thought of as getting the 180° polarity?

In a dimension chain of this model we have the other kind of "polarity" too between directions toward higher d-degrees and direction towards lower ones, outward/inward

the chain as such, including more or less of motions versus structure. (Inwards higher d-degrees motions could be thought of as "consumed" and translated into structure as when atoms absorb radiation.)

We could ask if not some other "dualities" belong to this kind, one of the opposites representing more of motion:
E.g.
- potential - kinetic energy
- amplitude — frequency modulation (as in the nervous system)
- Heisenberg's opposition between position and motion   (velocity, or "momentum"), impossible to define exactly in a classical way in the same measurement, entities that Bohr called complementary, and
- the particle-wave duality.
Also the proton-electron relation could be assigned to this kind, with most of the energy as mass in the proton, most of the kinetic energy in the electron, about equal to the proton in energy if that of motion is included, according to Gamow.)

The two kinds of polarity should of course be related in some way. In the original papers a "haploid" form of the dimension chain is suggested: (as an haploid gamete), which could be written $0 \leftrightarrow 4 \leftrightarrow 3 \leftrightarrow 2 \leftrightarrow 1 \leftrightarrow 00$. Perhaps we will return to it. In any case we don't entirely agree with Bohr's terminology, calling this "duality" or relation between d-degrees "complementary".

6) Superposition:

The physicists talk about wave functions - and phases before they collapse by a measurement in "yes" or "no", "up" or "down" etc., as "superpositions", stages which include both possibilities, not as a mixture of both but in a real sense undecided.

(According to the 5-dimensional model here they should rather be called "subpositions" with higher d-degrees underlying lower ones.)

Compare the first criticism of this model (page Presentation of the model): Where to find in the physical world the unpolarized d-degrees 4 - 3 - 2 - 1 ? It seems as if we only can identify the poles 4a - 4b, 3a - 3b etc. Where to find the unpolarized Direction potentially outwards/inwards, where "Volumes" unpolarized into Matter and Space?

L. says: The true inhabitants in the quantum world are wave functions which per definition are inaccessible for us. We could adopt this statement as an excuse for the difficulty in this model, and as an indication that the underground of our physical reality is pure geometries and mathematics. - as in music.

Here we assume that a "superposition" corresponds to the underlying next higher d-degree.

And *L* asks: What has become of the superposition when the wave function collapses? According to this model the theoretical answer should be: it is to find in the results (both yeas and no) of the collapse in the lower d-degree - plus in a new motion moment. (Compare about Einstein, how a motion of a falling stone can be illustrated in higher, 2-dimensional degree as a "static" curve, a structure.) The simplest example could be a spin 0-particle in the experiments, polarized into +/- spin 1/2, spin here interpreted in terms of motions.

Probably we should allow for real "super"-positions too, lower d-degrees in relation to higher ones, which can implode to the underlying deeper level.

**Coordinate axes as each others superpositions:**
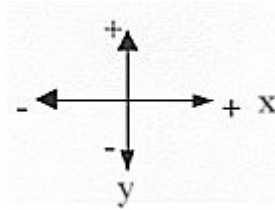
The y-axis is really a super- (or sub-)position, completely undefined, in relation to the x-axis and its direction towards plus or minus. And vice versa. With three dimensions there is a doubled superposition in relation to the two other axes.

   (Compare "vertical" versus "horizontal" personalities and their different aspects on who is above and who under, - and their different views on "abstraction levels" as deep down or high up.)

   In these experiments of quantum physics we have perhaps the real "inertia systems" which Einstein couldn't find in Macrocosm, born from their own origin and independent of moving, external things?

   A superposition which implies that something can be at two places simultaneously is not unthinkable, *L* says. This should mean that an entity c in the figure below could find itself equally existing in position A and B or virtually translated to these positions. Here this implies disregarding a quantum jump, or neglecting the inherent change of the physicist's viewpoint from one d-degree to another
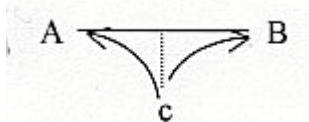
What causes a quantum jump or collapse of a wave function? For a 3-dimensional unity a 2-dimensional screen for instance? *L* says there is still a matter of dispute which physical effect brings about that the interference pattern disappears when detection of a photon is made in the "two slit"-experiments.

A measurement must be "reciprocal ? If something effects the measurement apparatus, some kind of "recoil" must also effect the measured something. Force and counter force. (Newton said it!)

   A photon, a quantum energy of light, is depending on the empty space, on $E = - mc^2$, on its propagation, according to interpretations on page "Electromagnetic fields". Hence, how detect a photon without disturbing this intricate interchange and the necessary coherence between the wave packages from two slits?

7) Bell's theorem and Aspect's experiments:

These experiments are said to show more ultimately the difference between classical physics and quantum mechanics.

   There were two instruments instead of only one in each path for photons with spin 0, with the magnetic fields in a certain angle to one another: one way from A to B, the other from C to D. (The angle in the illustration of the book of L orthogonal.)

   The outcome of the measurements at points A-C-B-D could only have the values +1 or - 1.

Bell's theorem: (AxB) + (AxC) + (BxC) - (BxD):
This formula could as a maximum get the value +/-2 if no coupling between different pathways. Aspect's experiment gave the maximum +/- 2 x √ 2:

Without penetrating the mathematics, could it be wrong to think of a figure like this below?
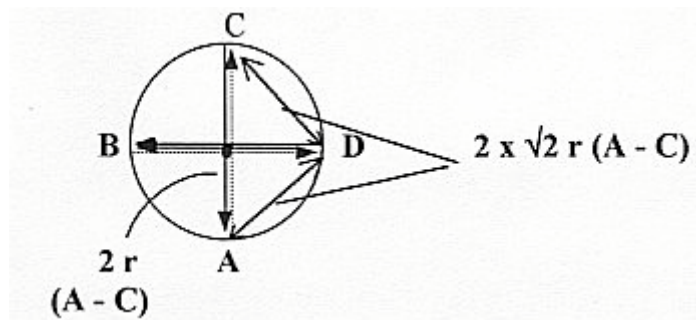
*Cf. aspects on gluons, about the **Standard model**).*

2 r is the distance between A and C, B and D respectively.
1 r, (+ or -) the value at A, B, C, D.
+/- 2 x √ 2 becomes according to quantum physics the maximal value.

   With two measurements in each path we seem to get, or detect, a 2-dimensional system: as a raised d-degree.

   This step seems to confirm the coupling between the 2 dimensions as potentials between outer "poles", as the existence of a short cut, defining the d-degree of surfaces or a 2-dimensional "field".

   We could perhaps presume that each new choice raises the d-degree one step?

   (It is said that the experiment is statistical: only one measurement is possible on each photon. The two angled magnetic fields in each pathway are (therefore?) arranged as a choice, a ramification.)

What if one had three magnetic field instruments in each pathway, angled 3-dimensionally? Could the possible sum of Bell's theorem increase to π or so? The shortest line between opposite measurement points being the orbital as in Einstein's curved space? (Or what if space was assumed to be hyperbolic: should that explain something in the results?)

8) "Immediate effects" - and "non-locality"
:
Physicists within quantum mechanics have big difficulties with explaining the "immediate effect" one particle seems to have on the spin or polarization of the other during such and similar experiments.

   The first to notice is that the physicists' theories and "laws", referred to in descriptions of experiments, always seem to have such "immediate effects": they "know" that the emitted particle has spin zero, or that the value A, B etc. is +/-1, or refer to the "law" that spin always is preserved. We don't doubt it, just notice it.

   Still more immediate effects has the physicists' postulates. So has Einstein's postulate about the velocity of light as the highest possible, That is one severe source to the trouble.

It's hard to understand the logic behind the "EPR"-argument for example. (E for Einstein):

   Two particles move in opposite directions: measuring the momentum (or the spin) of one, gives immediate the value of the other, without measurement, through "derivation". Hence, it is a real property according to E., without any uncertainty or collapsing wave-

functions. But it is obvious that "the wave-function" has collapsed in the physical law about preserved momentum or spin, in the brain of E.

Within the "derivation" through "laws" about preservation hides the polarization principle. With this one accepted, we have accepted too, that one measured particle immediately defines the property of the other - per definition. ("Laws" as "coherence" in the conceptual structure.)

And different measurements are only different ways to look at the created realities.

Vector fields as another aspect on "immediate effects":
Einstein liked the concept vector fields, rather newly introduced at his time. The concept includes "field lines" as a kind of 1-dimensional entities. If we accept this concept, for "potentials" of gravitation, for electric and magnetic "fields" and others, why not accept that the "field lines" are connecting links, just structures - as a road is connecting two towns. (Cars do not build the road.)

This means that an "immediate effect" can be 1-dimensional - or 2-dimensional etc.

Why should some "influence" have to "travel" along the link from one particle to the other ? And why should we have to dispute about in which direction the influence was moving, according to L. In which direction goes the road between New York and San Francisco?

In terms of the 5-dimensional model here motions are derived from polarizations of 1-dimensional "lines". Again: Einstein himself pointed at the fact that we can see the motion of a falling stone in a higher d-degree as a curve, that is in terms of a structure, not motion..

It seems as if the physicists in some way had cut the Gordian knot and now discuss how the rope's ends hung together.

Concerning velocities:
The conception in the model presented on other pages here is that the "quantum jumps" between d-degrees is so to say "orthogonal" to the d-degree structure or potentials.

These "jumps" should have nothing to do with the velocities for ordinary objects in classical physics in a certain d-degree. Strictly speaking, why should a d-degree step be restricted by Einstein's postulate about the velocity of light as maximum? Maybe that a motion, born through a d-degree step towards lower d-degree, has such restrictions. That doesn't mean that the step itself follows any such prohibitions.

To be able to brake the restriction of Einstein's postulate, there have been discussions among physicists, who want something to travel, about the possibility of double-directed Time. We can believe in such possibilities without the need for them in this context.

The relativity theory seems to imply that with two events, A and B, A can occur before B for one observer, B before A for another.

And mathematically, according to *L's* statement, light waves going backwards in time are not unthinkable, because Maxwell's equations are 2-dimensional and symmetric.

Schrödinger's wave function is 1-dimensional with respect to time, and not symmetric, but some physicists have the thought to divide it in two parts, one going backwards, one forwards. (Cf. about force and counterforce above)…. Or alternatively (Cramer) see it as one of a pair of equations traced from a totally relativistic basic equation. (*L.*)

With Time as an aspect on the relative motions of bodies, it should be possible to see it as partly only potential (virtual) in structures of higher d-degrees, as "built-in" into

particles and matter. Rather than talking about "backward" direction of Time we should perhaps in the first place talk about "inwards". (Time is stored inwards in the physicists' minds as memory.)

   Inwards, that is defining a center: perhaps the common source of the two electrons or photons in the experiments could be interpreted as reestablished in this sense. And "outwards" be equivalent with from this center. That would make the concept of "resonance" between the opposite poles reasonable.

About "resonance": it should be possible, according to the model here, to see a particle, interpreted as 3-dimensional, in linear motion as a 4-dimensional system: 3 + 1 = 4: this implying that the underlying higher d-degree of vector fields is activated. It shouldn't be necessary then to believe in some influence "traveling" via the common source to the counterpole of the particle, if the whole system simultaneously exists.

The common source and coherence between the pair of particles is a condition for the quantum effects. And this coherence should imply a kind of "field" in the source.

   Now, a rumor says that empty space has been recognized as representing some kind of energy, at least in Macrocosm.(The"negative" one of Dirac or opposite matter in another sense?). How can we then exclude as L. does every possibility that the quantum pairs has any other correlation than their common source?

L insists that we, in spite of all speculations, need some kind of non-locality, implying an immediate physical effect between the two quanta in the pairs.

   One immediate effect from other contexts is the change of the value of tangent at 90° between plus and minus infinity, and tangens represents the derivative of something, that is a lower d-degree than this something.

Concerning the **non-locality**, we can simply establish the fact that a surface is one kind of non-locality in relation to a point, and so is a line.

To part 2:
9) The particle - wave duality:

Quantum physics 2
—- some annotations —

9. The particle - wave duality:

Some general remarks:
In the classical experiment photons - or electrons (or even atoms) are emitted from a source towards a screen with one or two slits. Behind there is a detecting screen. With one slit open, the quanta behave rather like "particles", with two slits open the detecting screen shows interference, the wave behavior or property of the quanta.

   There is always in second - or third - forth ... hand descriptions of these experiments too little information. Very seldom conditions is such as the dimensions of the slits in relation to wavelength, the distances between slits (and distances between emitting source and screens). One such fact is that X-rays needs "slits" as narrow as in crystal lattices to show the interference patterns.

   Nor is anything mentioned about how the photons are quantified. How many wavelengths of light make a photon as a quantum? According to some information (oral, high school) one has made two-slit experiments which showed that there was no interference if single photons were emitted with a time delay representing circa 1 meter of a light beam. According to L. one gets an interference pattern even with "years" of delay between the single photons. This implies that we have to take all secondary information with a warning. L. also contradicts himself: On an early page (55, Swedish version) he points to the fact that an interference pattern only slowly is built up by a lot of photons, when single photons are emitted with delay. Later in the book (page 167) he says one single photon can show such a pattern. Probably only carelessness, but an essential one.

The so called classical physics originates from war and the reach of projectiles as bullets in Galilei's time. It seems quite natural that we have to leave this old, simple ballistic physics for interpretations of all underlying levels - and all the superposed ones as in biochemistry and life.

Two other general remarks:

- Physicists don't seem to make any explicit analysis in terms of changes in dimensional degrees. (?)
- They seem to neglect the empty (or vacant) space, ignoring its eventually essential role as collaborator. (By that also Dirac's hole theory and $E = - mc^2$). (?) Repeating what was said under point 5, part 1:

First there seems to be a mix up of two different kinds of duality:
We should distinguish between the particle-wave-duality and that operating in interference, even if the latter is said to characterize waves only. Waves are waves, even without any "interference".

   Particle - Wave duality is not the same kind of complementary polarity, not poles of the same dimensional degree, said in terms of the model here. But the so called "interference" patterns on the detecting screen are: as polarizations between positive and "negative" energy hits.

Secondly, about the concept of "interference":
Could it possibly be a mix up too of two different processes in this concept?

Is it really right to interpret the striped patterns appearing with two open slits only in terms of the typical interference of waves, alternately amplifying and extinguishing each other by the combination of their maxima and minima, as in texts about quantum mechanics?

If it's true as *L* says that even with "years" of delay between single, emitted quanta there appears an interference pattern, then obviously it seems as if quite another principle of polarization is acting too.

The particle-wave duality first:

From aspects of the 5-dimensional model here we have in other chapters suggested the preliminary view that "particles" are characterized by inward direction, versus "waves", characterized by outward direction.

```
5  –  4  –  3  –  2  –  1  –  0/00
         particle <------- or 4a (vectors inwards), 3a (circular)
                   -------> wave or 4b (vectors outwards),
                                              3b (radial)
```

Could such a view help us understand the experiments?

There is a difference in the d-degree of propagation: A classical particle has a linear (1-dimensional) pathway. A light wave too, according to the usual "classical" view: propagating along straight lines if not curved by gravitation (or eventually by the slits if these are small enough to brake up a single wavelength?). But the light wave oscillates in 3 dimensions, which eventually effects the surrounding space. (Cf. the hypothesis about "**side-waves**".)

Other waves, spread from a center, propagates in 2-3 dimensions.

A particle could be perceived as with enclosed center, with more of "impermeability" in opposition to a wave.

Hence, we should be able to look at particles as with more structure, less motion moments than waves, that is of a higher d-degree according to the model here.

Yet, this view doesn't agree with the way physicists illustrate and describe particle-like quanta as "wave packages", as consisting of only a certain, quantified number of wavelengths.

Photons as particle-like quanta of EM-waves seem to be identified as such in experiments where the direction is inwards: so in Einstein's interpretation of EM-waves hitting out electrons from atoms. So too in the fact that EM-waves can give birth to electron pairs near heavier atoms.

Note, this can happen when these heavier atoms can absorb some of the motional energy, as it is explained (right or wrong?) in some source. In terms of the dimension model: one motion moment less: implying more of built-in structure, a higher d-degree. (Cf. a braking, as negative acceleration - inwards, coupled with "**mass**".)

In these latter events we should also observe that the created quanta or "particles", the electron pairs, have opposite signs: e+/e-: e+ as Dirac's holes, out of "negative" energy, vacant space. This implies that the "surrounding" is used by the positive energy of the EM-wave, and that the wave gets transformed in complementary units like Yes or No, Particle - No particle and such opposites in these experiments.

Photons as the quanta of light belong to the so-called "**carrier of forces**" and also the other "carriers" use presumably the Vacant Space for their existence. A carrier between protons as the π-meson use anti-quarks from antimatter. We can note here that "forces"

as vector fields in this model represent d-degree 4, in principal "all"-directed, inwards/outwards.

If this view on particle-like quanta as of one d-degree higher should be valid, we could ask: What in the structure of the particle gets transformed to motion in a d-degree jump towards a lower d-degree ? One guess is that it concerns the M-field in some way, the M-field interpreted as a pole connected with Vacant Space and inward direction on some levels in this model.
   The concept "wave packages" doesn't express the inversion moment of directions in the structure between particle and wave character that we here presume, a kind of inside out turning: an into the particle incorporated M-component for instance, replaced by the use of exterior "vacant space" in the wave.

With the assumption that particle-like character implies a higher d-degree, the particle could also represent a kind of secondary "superposition". a superposition of E- and M-components for example (in photons, electrons, atoms...) as equivalent with "Yes" or "No", positive or "negative" energy forms... (Compare **Mass - Vacant Space** out of 4-dimensional vector fields.)

(Compare too "double messages" from parents as one kind of superpositions, which built into child can make the child enclosed into itself and lock its activity.)

Some physicists has thought about an eventual "resonance" between the 2 possible outcomes of a "collapsed" superposition (which *L.* brushes aside as a new mystery).
   It shouldn't be more mysterious however than the immediate coupling (or "resonance" between electric and magnetic components (E- and M-fields) in a wave or the like.
   A "collapsing" y-axis immediate defines both the outer poles +/- infinity of an x-axis in a 2-dimensional coordinate system, as immediate as a 0-pole, a point, defines an anticenter, a 00-pole, expressed in terms of this model. (However, physicists don't like "probabilities" higher than 1 (!) and specially not the probability of wave-functions raising to infinities, so they have to keep themselves inside a unity circle?)

Hence, if a particle-like quantum is characterized by inward directed "fields", is it then quite right, as the physicists do, to ask which of 2 open slits the "quantum" has passed? The direction of emitted quanta is outwards, and perhaps that implies a change in the structure to a wavelike spreading which we never can detect, while all registration concerns "incoming" quanta?
   A wavelike spread of the energies could theoretically mean that both slits are reached simultaneously. We could possibly imagine a "photon" or an electron divided into halves - as along the +/-halves of an x-axis*, "interfering" on the other side of the slits, recombined to single units when hitting the detector screen, but still it's hard to think of whole atoms in that way. (Only conservatism?)

* Compare how electrons sometimes are divided like that in illustrations of some orbitals in e-shells, as half loops around the halves (+/-) of the coordinate axes. Perhaps there could exist a coupling with the 2-slits phenomenon?

If we really separate the question about "interference", why couldn't we just think that an emitted "particle" takes sometimes this way, sometimes that way, when two slits are open? It shouldn't matter then that one destroys the "interference" by a measurement just behind the slits.

In the efforts to answer such a question about which way the quantum has passed,

keeping to the idea of a particle, - and non-locality, a physicist like Feynman has talked about the particle taking "all ways" through the room. That is a 3-dimensional way. While another one (Hawking?) has used the metaphor of a globe where all directions straight outwards from the North pole lead to the South pole - a 2-dimensional spread or propagation.

With the concepts in the model here we could imagine an outward directed vector field (pole 4b) activated when a quantum is emitted from the source: the source or the quantum getting the role of a center (pole 0). As said before, we could think of a 3-dimensional particle with 1-dimensional motion as a whole 4-dimensional system, activating the level of vector fields.
   We could perhaps think of this field as similar to a balloon: One slit in the first screen in the experiments should get the role of a prick in the balloon: all its inner energy should gather (to a "point") and "leak out" that way.
   Is it then the vector field or an "individualized photon", particle-like through the inward direction towards the slit as a center - that escapes that way?
   With two open slits in the screen, there would of course be two ways for escape of the energy, and two radial vector fields on the other side.
   Of course we have to believe too that a volume of energy has an enclosing border or surface of some kind.

   Has there been made any experiments with a partition wall between the slits towards the emitting source ?
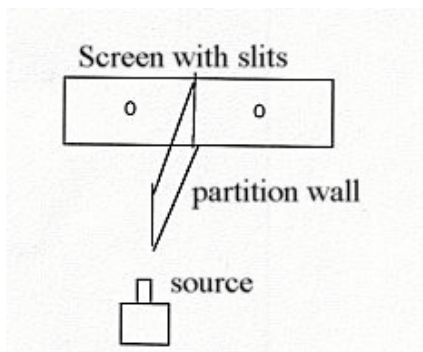
   Or with a rounded screen with the slits?

Another question about experiments:
   If one photon was "shot" straight through one slit in the screen, and should take only a straight 1-dimensional way through the room towards this slit as as we are used to think that a ray of light does: then if we placed our eye or a detector on this side of the screen (before passage) and just a little bit beside it, we should not be hit by it or able to detect it - should we?

With all these thoughts on ("guiding"?) vector fields, quanta taking "all ways" through the room , balloons etc., the question seems to remain why the energy packages transforms to only one point on the detecting screen behind.

"Interference" patterns:

Interference is not inherent in the definition of waves.
Interference patterns need 2 open slits in the screen to appear, which eventually implies

- 2 sources of complementary forms of energy,
- plus the conditions: same energy source, and coherence (*L*).
   This is another kind of a polarizing principle, acting between similar "poles" or sources - but still acting complementarily.

As said above: If the statement of *L.* is true that one gets an "interference" pattern even with "years" of delay between single, emitted quanta when to slits are open, then it is hard to explain this pattern as an interference between waves only, alternately amplifying and extinguishing each other by the interaction of maxima and minima, as one does in texts about quantum mechanics?
   Yet, if we imagine the single quantum (inward form) transformed to a wave (outward form), according to views above, and the wave passing through both slits as +/- ½ or something, we *could* get interference by that single entity. In that case we have to imagine that this interference in some way prepares the detecting screen as surface with a virtual striped pattern as a kind of guide lines, in spite of it hitting just one dot on the screen. A preparation below a threshold value? Potentially activates the other detectors on the screen?
    (One could perhaps compare with the nervous system, with amplitude modulation inwards towards the nerve cell, and threshold values that have to be reached before the nerve cell reacts with a frequency modulated signal outwards?)
   But should such an effect remain with years of intervals?

Another question concerns the look of the striped "interference" pattern: These light and dark, parallel bands (according to illustrations): are they really the pattern that interfering sea waves (or sine waves) give for example?
   Obviously the polarization giving the "interference" patterns in these experiments works transversal, orthogonal or "circular" in relation to the directions of radiation or pathways of quanta.

Couldn't we suspect that there is another polarization principle acting too here, the more fundamental polarizing principle, acting complementary also on superposed levels, as in biochemistry, biology and social structures ?
   There is a multiplicity of similar phenomena on higher levels among objects which behave according to classical physics - while they lack "coherence" in their inner details as *L.* describes it. (In this description L's view is that of an assembly, while we here think "the whole" comes first.) Just to mention a few examples:
   We have the polarizations in the nervous system in the general opposition between the systems of inhibition and stimulation, sharpening the contrast. One single example is inhibition signals around activated receptors in the organ of hearing.
   There are layers in air above earth and in ocean currents with polarization in contrasting temperatures. So too, one says, in cosmic clouds where heat and cold areas can get separated, apparently in opposition to traditional views on the spread of temperature.
   Among living organism there are such things as arrangements of upwards and downwards leading ducts in plants. Among "classical objects" as human beings there is the grouping phenomenon, as between lion families, creating "preserves", where the operating force is expressed as "attraction and repulsion ".
   Kinds of "interference patterns" ?.

In pure geometries:
2 opens slits as centers define a line. This line gets polarized into "motions to and from each other" according to the model here. That could be in forms of "negative" and positive energy, giving the striped patterns.

   In terms of this 5-dimensional model we have the complementary poles inwards / outwards, mass / vacant space, E- / M-fields etc., or just directions +/- of a coordinate axis from a center.
   Density, suggested as the only physical quality in d-degree step $5 \rightarrow 4$ implies 1 d-degree branched off: (as the "line" between the two open slits?), which polarized to "d-degree 0/00" gives "motions to and from each other".
   (If each 1-dimensional component of a d-degree is possible to analyze in pure motions (in agreement with first postulates), then also the transversal or circular one of pole 3a in this model: implying a density wave of that geometry too.   Compare perhaps the hypothesis about "**side-waves**" here and possible changes of the values of "negative" energy of empty space.)

Two open slits in the screen is needed to get an "interference" pattern:
   Reflect eventually upon this metaphor:
2 persons as similar centers talking with one another:
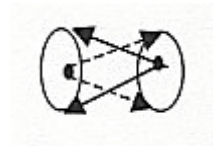One listens; ears on the side of the head.
The other talks, activity from the mouth, from the center of the head.
Then interchanging roles.
   Center and anticenter as 0- and 00-poles in a consecutive process.
   The root of the talking is vector fields, but the radiation takes the form of more or less individual quanta as words.

   The persons illustrate two opposite gradients into one another.

Two other questions about the particle - wave duality:

What happens in the slits, if they are small enough to brake a single wavelength and not give room enough for its whole amplitude and the necessary counterdirection from empty space which it eventually needs?
   Perhaps changes of roles between the complementary factors making up the wave or quantum?

Which physical effect makes the "wave function" collapse when a measurement behind a slit is made?
    As said earlier (point 6 in part 1), something have to effect the measurement apparatus and this effect should reasonably have a "counteeffect" (as a recoil) on the measured something, which could disturb the coherence, the necessary condition for "interference". (Newton's law about force and counterforce.).
   Or, if in the discussion between two persons above, a third person, say a professional physicist like Bohr, interrupts, surely the discussion will "collapse" between the two perhaps equally silly and "coherent" persons - continuing eventually along a new line between discussing partners of different origin.

s

Einstein - some annotations

1. Outwards - Inwards, and the "center" concept

From the aspect of the model presented on this web page it is rather confusing that Einstein in his books from 1916 or 1938 doesn't clearly differentiates between directions outwards and inwards.
   Acceleration as gravitation and as the opposite, acceleration in a starting, lifting airplane is mentioned with almost no distinction. (It's said to be one of Einstein's fundamental experiences, the gravitational force he experienced in such an outward acceleration.)
   Behind this lies the lack of a clear perception of the concept "center", a concept not mentioned either.

Yet, the whole idea behind Einstein's relativity theories and search for transformation rules between different coordinate systems implies the concept of different centers as origins in the coordinate systems. They are only implicit, not mentioned or really observed, Einstein already soaring around out in the three-dimensional space between the axes.

Concerning the directions outwards-inwards we have a similar case: He had the good idea of a "cosmological constant"* (A) for an expanding space of Universe, a repulsion mechanism, which means the opposite direction to gravitation, even if he later and wrongly abandoned it. (According to a rumor physicists rather recently have found evidence for such an expansion of Universe.) (Compare G/A-fields in the model here)
   As it seems, Einstein didn't really recognize the kernel of his own intuition.
   (And the centrifugal force was still seen as a fictitious force, only the effect of inertia of a mass, and still seems to be viewed as such.)

(Einstein theorizes about gravitation as if it comes into existence by acceleration - in an arbitrary direction - without reference to any center. In comparison with the model here we could put a question mark after the expression "comes into existence". A force gives birth to an opposite force according to Newton, all right. But they could eventually be seen as born simultaneously, just revealing one another.)

2. Motions preexisting as structure elements in higher dimensional degrees (d-degrees):

Einstein showed how Time, related motions, as a 4th dimension could be transferred to the same side of an equation as the 3 space dimensions and thus make up - or be viewed as - a 4th space dimension, a structure. He describes the 4-dimensional space-time as the "being", the 3-dimensional space with motions as the course (or process), the "becoming".

In another context in his books he also points out and illustrates the simple fact that the motion of a falling stone can be illustrated as a linear curve on a 2-dimensional surface with coordinate axes for time and position. Einstein says: "Now motion is expressed as something which *is*". Once again, a structure element instead of a series of measure points as a picture of motion.

Here as elsewhere it seems as if he missed what the kernel in these views could imply. In the postulated assumptions of the **5-dimensional model presented** on these pages we can say that this kernel is made a very essential part, with structures transformed into motions during steps towards lower dimensional degrees.

One reason why Einstein didn't developed these thoughts could be that he saw "motion as such" ("in sich") as a concept we cannot give any meaning. And one interpreter says: "It has always been self-obvious that motion as we interpret the concept must be perceived as relative motion".
   But can we give any such concepts, as mass, charge, distances, particles etc., any meaning in themselves, without referring to other concepts, in their turn only possible to define in third terms…?
   In these more general statements about motions and in the public's idea about "relativity" there is much vagueness.
   Einstein himself took the fix velocity of light as a postulate and an absolute reality - and how to count on a velocity without something moving?

We can try to see motion as only a change in the relative position between two bodies (as a derivative of a distance), but if a jogger runs through the wood, which part will lose energy, the jogger or the earth? There is something with energy too in motions. Even if a uniform motion doesn't demand any force as Newton said, something put the body on the track.
   With three objects changing their relative positions, it gets still more difficult. Imagine two persons separating walking in different directions, and we choose to regard them as the fix resting coordinate systems, the earth under their feet would be seen cracking, wouldn't it?!
   There is more in **Motions** than the relative aspect. And it seems much easier to imagine the planets circulating around the sun than seeing the sun circulating around each individual planet.

3. The deflection of light around the sun: gravitation, curved space and/or influence of magnetic fields?

Einstein's prediction about this deflection from a straight line proved to be true. Only about a half of the deflection could be explained by Newton's theories, so one says, the other half depending on the curved space around the sun and Einstein's interpretation of gravity in the general relativity theory.

Some physicists at that time, who had difficulties with this theory, thought this deflection could depend on magnetic fields.

Without knowing anything more about their arguments, one can say that according to the model here there shouldn't necessary be any contradiction between these different views:

Firstly, we have the assumption that magnetic and electric fields, **M/E, are developed out of G/A**, gravitational and outward acceleration fields as more complex combinations of the first complementary "poles". There is in that case a connection and relationship (as between father and son?) between what gravitation represents and the magnetic component of electromagnetic fields: a natural assumption in its most general formulation.

The physicists' disagreement could just be different aspects on the same thing, a question of analyses in different dimension degrees.

Secondly, we have in this model assumed the view that the **propagation of light waves** depend on the "negative" form of energy of vacant space. We have assumed that celestial bodies, as long as they are matter and not collapsed to merely a mass property and black holes, are depending on their "consumption" of that negative energy too. In their neighborhood this "vacant space" could be less satisfying nourishment for light beams to keep to their straight course.

[Some physicists say the magnetic moment totally depends on the motions of electrons. Oscar Klein, commenting on Einstein's theory, says that the gravitational force, like the magnetic one, should be caused by the motion of the bodies. We cannot agree with the formulation "caused by".

Here we see the two complementary forms of energy as with equal rights, and would sooner suggest to describe the same thing (if true) in another way: When the more noticeable bodies or particles move, the electrons for instance, the motion plus the body represents a deeper, higher d-degree from which the body and its complementary part were polarized (as **E- and M-components**). It connects the complementary poles and thus activates its counterpart. (?)

The sun, one says, has a magnetic field divided in sectors of alternating polarity. Is it really possible to reduce such an example to only a relativistic effect of electrical charges?]

4. Can the curvature of space or space-time replace the gravitational force?

It has been said that Einstein did - and thus explained "gravitation". "There is no need for presumptions of gravitational forces…The gravitational equations of the general relativity theory are 'structure laws'" (*Foster*).

Firstly: It seems as if we have a false or unclear opposition between the concepts of "structure" and "forces". In the 5-dimensional model on this site here we have suggested to see **each dimensional degree as a force in relation to higher or lower d-degree**, and most elementary vector fields of d-degree 4 as binding "forces" in relation to mass.

Secondly: Why are big masses curving the space around them?
How explain that without using the illustrations of gravitational heaviness of balls in 2-dimensional nets?

We could rather believe that centralized masses and empty space are complementary structures born simultaneously from polarizations into positive and negative curvature of structures… In compliance with this view and the model here Einstein denied the existence of an independent "absolute Room" (Newton's idea), which he found a "pre-

scientific idea".

In reality, no physicists seem to have succeeded in dismissing the gravitation concept, still mentioned as a force in the standard model. (Remember too: the deflection of light around the sun was said to depend only to one half on curved space, to one half on Newton's laws for gravitation.)

For a body falling vertically from the sky towards earth, it must also be difficult to think it as depending only on a curved space.

Thirdly: In his general relativity theory, Einstein let such forces slip in through the backdoor with **the tensor concept** from mathematics, with the help of Gauss. Foster again: "While scalar and vector fields are sufficient to formulate Newton's theory of gravitation, tensor fields are an additional requirement for Einstein's theory". "An elastic body is placed under stress by body forces (such as gravity) acting throughout its extent and by forces applied externally to its surface". There we are again, with the gravity.

What Einstein studied was transformation rules for celestial bodies in relative acceleration to each other, that is in motion. This could be interpreted as studying the realities in a lower d-degree.

Tensor fields, what is it: neither scalar fields (as a density gradient) nor vector fields. They are also called "vector fields of a second order". One example is mentioned: when a material has different conductivity in different directions, presumably as alongside and right across.

Hence, without being mathematicians we could assume that these tensor fields introduces a more or less perpendicular relation between directions - the one we in our model here have presumed characterizing d-degree 3.

(Compare perhaps the presumed Higg's field, in some way "horizontal" versus "vertical" ?)

Rotation as a 2-dimensional motion is in our model attributed to d-degree 3, and rotation is a form of acceleration.

We could see this motion as a result or transformation of the binding force between the complementary "poles" Mass - Vacant Space.

We could put the question in this way: Which virtual motion as a built-in structural element in d-degree 4 is "precipitated" to motion in the d-degree step 4 → 3? It ought to be the vector character of direction inwards-outwards, which more or less gets lost in rotation (compare elliptical orbits).

The conclusion could be that the gravity which Einstein explored, could be the relation between these complementary poles Mass and Vacant space, not (primarily) the one between 2 celestial bodies, two masses which Newton was occupied with.

(This can have relevance for the question: How can forces act over distances? See further down.)

With Motion realized as acceleration we get a relation between Masses and Vacant space, between forces G and A, centripetal and centrifugal forces, as a relation of (more or less?) 90°. A curvature. The gravitational force is also said to be strongest along the rotational axis, the centrifugal force along the equator plane. And the strength depends on velocity too.

So much about the d-degree step 4 → 3.

The reality of a centrifugal force?

Einstein wasn't ready to accept the reality of the centrifugal force, as he abandoned the thought of "the cosmological constant" (A) and "negative matter if it existed". Of the

same reason, surely, he denied Magnetism the property of a force in its own right. He wanted to see electric and magnetic properties as only a relativistic appearance of the same thing, from different coordinate systems in relative motion. (In spite of the fact that the expanding energy of Vacant space now appears to be acknowledged, physicists still seem to keep to the same views on these "illusory" forces.)

(One says that the magnetic field in the sun is divided in sectors with opposite polarities. It sounds hard to interpret this as only a relativistic effect between different coordinate systems in relative motion…?)

Have these things something to do with the opposition between **heavy mass and mass as inertia**? Renard writes: "At rotation the inertia moment plays exactly the same role as the ordinary (read "heavy") mass at translation".

Einstein showed in his relativity theory that the heavy mass and the mass as inertia must be of the same size. Is it just a question of analysis in different d-degrees - and the difficulty to detect the "negative" energies?
Einstein found the two kind of masses over and under a fraction line in his equations and thus possible to reduce away.

D-degree steps or complementary poles as inversions?

Two such examples:
   Waves: A little wave, governed by surface tension, propagates with a velocity inversely proportional to the square root of its wave length, while a bigger wave, governed by gravitation, propagates with a velocity directly proportional to the square root of its wave length. (Thompson)
   Celestial masses: The radius of white dwarfs is inversely proportional to the cubic root of their masses, while the radius of stars on the main series is directly proportional to the cubic root of their masses.

Matter as a combination of the opposite forces:

We surely have to see non-collapsed Matter as a combination of Space and Mass, of Acceleration and Gravitation. The A-factor built-in into matter inside stars. We have "radiation" keeping up the volume, we have stars expanding to big red giants, we have exploding stars… And the big difference between atoms with "emptiness" between electrons in the shells in particle models, and the atom structure collapsed to neutrons. Further, we have the disintegration force of weak interaction inside elementary particles. Probably all of this can be thought of as manifestations (in different d-degrees) of an elementary centrifugal force.

In the direction towards microcosm Space built into mass, in the direction towards macrocosm: Mass built into "Vacant Space".
   So why don't accept the centrifugal force as a real force?

How to interpret the relation Mass - Mass, seemingly without complementarity: as of higher or lower order or d-degree? As some combination of two relations Mass -- Vacant Space, or what?
   Between two M-fields we have attraction or repulsion, repulsion if similar poles, attraction between opposite ones. And the like between electrons with opposite spins in the atom shells.

Newton's gravity theory needed only scalar and vector fields. Vector fields are described as the derivative of scalar fields. We have in our model suggested Density (a

scalar fieeld) as first physical concept in d-degree step 5→4, in later steps polarized and appearing as Mass per Volume.

The polarization principle seems to be active in the gigantic celestial clouds of stuff, so one says, with polarizations between hotter and colder areas, which contradicts the older views on terrestrial temperature diffusion.

Newton's binding force was a relation of 180° and only depending on Distance, a linear entity. The centrifugal force depends on velocity too, (This holds also for the relation E-M, between electric and magnetic fields.)

The attraction force between opposite charges are dependent on the charge value, which got Einstein to put this force in opposition to the gravitational one, only dependent on distance. But there is no opposition if we see mass and space as first complementary poles, in similarity with positive and negative charges.

One conclusion could be that Newton's gravitation between different celestial bodies is not a pure attractive one, or just part of the relation, and that we have to count on an opposite force at the same time, responsible for the partition of masses and the distances between them? (Cf. the planets not attracted into the sun, and the same for the arms of our spiral galaxy.)

5. Can forces act over distances or not?

Newton's gravitational theory seemed to imply that they could. Gravitation had an immediate effect from far off, without mediation. Einstein said no. He adopted from Maxwell's theories about electromagnetism the concept of fields, rather new at his time, (and saw an opposition between forces and fields).

He meant that the impact of gravitation between bodies had to propagate as light does, and with the same velocity. And physicists are still looking for the presumed mediating particle, the *graviton*.

But doesn't the concept of "field lines" contradict this view? Which reality should then be attributed to these "lines"? And what about his own geodesy of the curved space, the more or less prescribed pathways as geometrical lines? How is it possible to deny an immediate effect over distances at the same time as adopting the concept "fields of forces"!

It seems as if there is a mix of two things in this general statement, mix of a static and a dynamic relation:

In our model here we have said: it's forces that create distances, as the acceleration force created Space during Big Bang.

Vector fields, chosen as the concept for the 4-dimensional phase, are not distinguished from forces. Such vector fields can simplified be seen as potentials with direction, "lines" of relations - and in a static configuration the relation line is there, **is** the immediate mediator.

Compare a railway: the real force is underground, the need for it, on a more abstract or invisible level. The quantifying of it in gathering different building material is a later substantiation.

And physicists still lack any god explanation for these gravitational effects over distances, so one says.

Another thing is if a change occurs in one end of the relation. This change may have to propagate along the connecting "line" or field as a kind of wave. Some modern

physicists presume too that gravitons only "can be found" when big changes occur in celestial masses.

Yet, according to the 5-dimensional model here, there should be one d-degree of external motion debranched through -degree step 5 → 4 (that means polarization and quantifying of a line) even in a 4-dimensional field, a linear motion:

How to solve these contradictory views?

According to our model such a linear motion should be an expression for the 5th d-degree and the relation between mass and the complementary pole, that is the "empty" space, not directly between two masses, as suggested above.

(This could be one aspect on the fact which Galilei showed, that heavy and light bodies fall to the ground with the same acceleration speed - a fact that Einstein had big difficulty to explain in his book. The same is valid for the centrifugal force, not depending on the mass.
   Another general explanation of Galilei's experiments, according to our model, could be that vector fields such as gravitation and an outward acceleration force as of higher d-degree precedes the creation of masses, and for this reason are acting independently of such things as heaviness of these masses.)

So, if we accept that there is a motion (which takes time), representing a translation of the 5th dimension degree, in a gravitational vector field, we have still 4 d-degrees as structural vector elements, more abstract potentials, to be viewed as a reality preceding the motion and not having to "propagate", in themselves being "immediate effects" à la Newton.
   We could have both, an immediate effect over distances, and something propagating, taking time?
   And as suggested above: the attractive "line" of d-degree 1 could only be a part of the relation.

The linear motion moment assumed in 4th d-degree could perhaps be connected with **the fluctuations in density** in the negative energy of Vacant Space which Dirac (1960) mentions, and "an infinity" in these density variations which the mathematics of that time didn't manage to handle. He meant it demanded a radical change in the physical theories of his time.
   Density variations as 1-dimensional L-waves along "field lines"? Compare the suggestion in our model that the first physical quantity in d-degree step 5 →4 should be just Density, and that the outer poles defining d-degree 4 should be 0 and 00, zero and infinity.
   Something has been said too in later days about fluctuations in gravitational fields on very small distances, 10^{-16} m (less than the diameter of protons).

The very small fluctuations that have been detected in the background radiation of Universe concerns EM-waves, electromagnetic radiation. This is seen as a rest from Big Bang and a cause to the unequal distribution of mass in Universe. But couldn't it alternatively be interpreted as a secondary result of fluctuations in an underlying or more primary relation between G/A-fields?

A note:
About the velocity of the motional component:
In T-waves, as the electromagnetic waves, the energy has transversal ways of expression. In gravitational waves, presumed to be longitudinal L-waves, the energy has not. Couldn't that be a reason for these L-waves to travel much faster than light? (Oscar Klein said the propagation of gravitation with the velocity of light was a condition for Einstein's theory. Right or wrong?)

6. $E = - mc^2$; Einstein and the imaginary world - and about EPR

It's rather curious that Einstein doesn't mention Dirac in his book from 1938 and Dirac's second solution to his own equation: $E = mc^2$, that is
$E = - mc^2$, with the development of Dirac's hole theory, positrons as "holes" and such things...
   It seems as if he didn't like a negative world or appreciated the "emptiness", in spite of this (relative) emptiness being a condition for his own moving around.

Nor seems he have liked the imaginary world of which so much indicates the existence. (Dirac 1958 about positrons: Each negative energy solution of the equation [$E = mc^2$] is the complex conjugate to a positive energy solution.)
   Einstein introduced $\sqrt{-1}$ as a factor making time to a space dimension, purely mathematically.
   But he dismissed or brushed off every thought of possible velocities higher than the velocity *c* of light, *since* it should give the Lorentz' transformations for the special relativity theory imaginary results. It would give negative lengths.

(It's said that Einstein's presumption that no signals can propagate faster than light, is a condition for his relativity theory to be without contradictions.)

But what is a negative length?
It should be a distance in direction inwards the body.
Einstein's dislike of these things has probably connection with his disregard of the direction "inwards" - and centers - versus outwards, occupied as he was with outer relations between substantial bodies.

Negative lengths as inwards:
Compare negative distances with how 4-dimensional cubes has been illustrated, as cubic holes inside a substantial positive cube. This means negative surfaces and volumes too…
   (We can imagine $\sqrt{-1}$ as the side of a negative square defined between the negative axes in a coordinate system. We can imagine this negative direction as inwards in relation to more fundamental mass centers.)

There are the many connections between negative values and imaginary (complex) ones as for Dirac's positrons and for example lg. x which has a pure imaginary term ip for negative values on x.)

Negative energies, velocities and (surely?) accelerations have been discovered in microcosm, and as imaginary or complex realities they must - reasonably - have been essential factors in the creation of **properties as "Mass"** and "**Charge**". (A simple picture for the principle could perhaps be a crashing car: its positive velocity being built-in into the car.)

(There are speculations too among some physicists about backward directed time in connection with quantum phenomena. (As we could talk about backward directed time built-in into our memories!).

In biology we can identify a negative curvature inwards as a main principle of life (see later some extractions from the booklet Biology).

Inversions is one simple form of the direction inwards, from the outer side of the unit number one (1) to the inner side, in direction towards Zero (0). Inwards towards higher d-degrees too.

Hence, if we allow us to believe in an "imaginary" world representing more than a mathematical convention, and connected with inward direction, - imaginary expressions for not only time but potentials, surfaces and matter, negative values for acceleration and velocities - and inverted numbers, we shouldn't be prevented from imaging velocities higher than c.

Perhaps we had such velocities during an eventual "inflationary" phase in the beginning of Universe (?), presumed by some physicists and astronomers. If so, what about the "gravitational answer" ?

About "pure mathematics": Einstein's formula $E = mc^2$ includes a factor c squared. And in his general relativity theory there is a formula for the energy loss through "gravitational radiation" with a term c^5 under the fraction line.
  $dE/dt = [32 \, G \, I2 \, w^6] \, / \, \mathbf{5 \, c^5}$. Surely only meant as a mere mathematical term, not intended to be interpreted as such an enormous velocity, but how if we did ?

In any case, Einstein shut himself out from such an imaginary world, as it seems. At least in his first theories.

The EPR-experiment:
Yet, in spite of his dislike for the imaginary world, Einstein was one of the contributors to the so-called EPR experiment in 1930th (E for Einstein): an only theoretical experiment (at his time at least) which concerned quantum mechanics.
  Many such experiments have been verified later, according to *Penrose*.

If a pair of photons for example separates in different directions, both with left polarized spin, and direction of the spin of one of the photons is turned by an apparatus, the spin direction of the other photon changes mysteriously in the same way.
  This shows on an immediate coupling between the two photons, which cannot be explained as transfer of information with the velocity of light. Thus it has been called a "supraluminal effect" and is not dependent on the distance.
  Mutually seen, from a position between them, the separating photons have a complementary spin direction as far as I can understand, both before and after turning of the spin?

EPR effects are still not possible to explain with present quantum theory. (Nor is there any agreement among physicists so far on how to interpret such things as Heisenberg's uncertainty principle or the proper sense of Schrödinger's wave function.

Any "potentials" between the two photons in such examples as mentioned above and other similar experiments don't the physicists talk about, according to the references. "Potentials", however abstract, that we have suggested in our 5-dimensional chain. But if there was such a still undetectable, connecting "line" as affect between the two photons, could some kind of perpendicular wall crossing this line change the results?

We could suggest instead that the connection "occurs" or **is** there through the common source.

Compare in our model the difference between the outer connection between complementary poles as representing a dimension degree, and the inner connection through underlying higher d-degree as a kind of what is called "**superposition**" (should rather be "sub-position"), when a time factor still could be just a built-in structural element and not yet realized as a time-creating motion. This with a certain degree of support in Einstein's own view on motions as structural elements in illustrations of higher d-degrees.

7. The rotation of the elliptic orbit of Mercury

One of Einstein's famous successes with the general gravitational theory was to explain this rotation of the elliptic orbit itself. Not only the planet rotates, so does the orbital too.

Couldn't we see this in a simple way as an example or illustration of the views in our model here that geometrical forms have more of a reality in themselves, and that planes as 2-dimensional structures from the outward point of view could be interpreted as preceding a linear, 1-dimensional pathway.

A 2-dimensional motion is debranched through d-degree step 4 →3, when vector fields inwards/outwards (including gravitation) transforms to mass and space according to our model. But if the orbit is interpreted as a structure in itself, it should strictly speaking have a 3-dimensional motion according to this same model, which should imply a change in the angle of inclination too?

———————————————————————

Some books, referred to above:
Einstein, Albert: *Relativity: the special and general theory. 1916.*
(Swedish edition, Göteborg 1997.)
Einstein, Albert: *The evolution of physics*
(Swedish edition). 1st edition 1938.Stockholm 1965. (With Infeld, Leopold)
Einstein, Albert: *Field theories, old and new*. New York 1960.
Klein, Oskar: *Einstein's relativity theory in a general applicable form.*
(In Swedish), Stockholm 1933.
Dirac, P.A.M.: *The Principles of Quantum Mechanics*.
Oxford 1958. 1st edition 1930.
Foster, James: *A short course in general relativity*. New York 1995.
(With Nightingale, J.D.)
Renard, Krister: *The Foundation of Modern Physics* (in Swedish). Lund 1995
Penrose, Roger: *Shadows of the Mind. A search for the missing science of consciousness*. Oxford 1994.
Thompson, D'Arcy: *On growth and form (Abridged ed.)*. Cambridge 1987

The String Theory – comparisons

Reference: *Greene, Brian: "The Elegant Universe, Superstrings, Hidden Dimensions and the Quest for The Ultimate Theory",* Imprint: Jonathan Cape*, London. (Swedish translation, 2003).*

When the 5-dimensional model here was developed and the booklet series behind this home page made publicly available in 2000, this String Theory (ST) was unknown to me.

   Yet, the theory seems to have several traits in common with the so much more elementary model here, - at least be possible to interpret as in accordance with it.

Some comparisons:

1. The level of analysis is optional:
The level or dimension degree (d-degree) of analysis is optional according to our first postulates (see **Presentation**). This means that an analysis of the physical world in d-degree 1 (of lines), in accordance with the string theory, should be as adequate as in 2-3-4 d-degrees.

2. Dimensions as building stones:
The String Theory (ST) uses dimensions as building stones as in he model here. ST sees the world through the only concepts of Structure (in first place 1-dimensional) and patterns of Motion (vibration).
   Compare from the file Presentation:

Chain of Motions, d-degrees: 0/00- 1 --- 2 --- 3 --- 4 --- 5
Chain of Structures, d-degrees: 5 -- 4 --- 3 --- 2 --- 1 ---0/00

However, the **definition of the concept Dimension differs**:
   In opposition to our model, ST seems to define a dimension just as geometrical structure and ("independent") direction of motion. Nothing more is said on that subject in the book. One should perhaps see these views as two different definitions? We could ask: Which direction of motion defines the first 1-dimensional string? Or rather: which relation exists between the 1-dimensional structure and Motion as such?
   In our model a dimension is defined through its outer poles, characterized by

complementarity. (Polarities of such kinds come into the String theory in much more muddled, entangled ways, see below.)

And Motion in our model is defined as a polarization of a 1-dimensional structure.

3. Problems with the Infinity as a background to ST:

Physicists got problems with infinities appearing in their equations during the development of quantum physics, where they thought they had to handle elementary particles as points, and especially so when trying to unite the general relativity theory for gravitation with quantum mechanics. This is said to be the background to the String theory, the motivation to start with 1-dimensional strings instead of particles as points.

Thus, the reason for ST is just to avoid something, this infinity, which in our model cannot and shouldn't be avoided, just redefined as anticenter.

Compare in our model d-degree step $1 \rightarrow 0/00$:
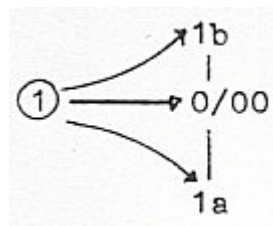
Definition of infinity as anticenter demands of course a center, a singularity (with physicists' term).

2 crossing lines or paths of motion define a point, in direction inwards the point, zero, and after crossing one another, in direction outwards, the "infinity".
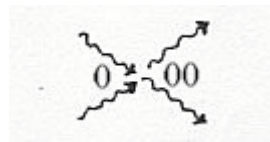
Mathematically, we could think of inversions around number 1 in a coordinate system. To reach the point from number 1 we need to write 10^{-00}. Inverted we get the infinity 10^{+00}.

When physicists get infinities in their equations, such as a probability higher than 1, (in ordinary mathematics impossible) - we must presume that that there is something wrong, not with the infinity but with the concept of probability in this Schrödinger context. Perhaps the error could be found in the attempt to analyze or find the electrons in two different d-degrees of appearance at the same time, in the same equations?

Passing the border number 1 of probability might represent a d-degree step ?

(As Greene touches upon, the difficulties may have raised through assumptions, which the physicists themselves have invented.)

Here we suggest the more general view that these difficult infinities just mean "on the other side of", that a term from the complementary world has been involved in he equations.

We could eventually take the footprints of a walking person as an elementary metaphor: the right foot on the ground, with a definite position, the left one up in the "infinity", unspecified, undetermined. (?)

Concerning the infinities appearing when physicists try to unite the **gravitational force** with quantum mechanics: they seem very natural according to our 5-dimensional model

here: this force seen as defined by direction inwards in d-degree 4 with "outer poles" 00
<=====> 0:
that is direction from anticenter (~ "infinity") towards zero (0).
   (Nothing is explicitly mentioned in Greene's book about the opposite force (FA), the
vacuum energy, and outward direction.)

When physicists treat particles as points and are confronted with infinities as problems,
we could from our point of view conclude that they have missed the 5th dimension
degree as defined in our model - or just haven't developed any mathematical way to
handle the 00-pole.
   More about the 00-pole and the infinities further down.

In any case, irrespective of the infinity problems, an analysis in d-degree 1 should be as
well justified as in terms of 2-dimensional shells or 3-dimensional bodies or vector
fields.

4. Number of dimensions:

The String theory counts with 11 dimensions, the 4 usual ones with 3 space dimensions
plus 1 for Time, and 7 "undeveloped" ones.
   (Nothing is said in Greene's book about how they count: the strings as structure seem
to belong to the 7 "undeveloped". Remain then 6 different motion directions for the
vibration of the strings ? But in another statement these 6 are said to be divided in
removals of the whole string (change of position), and on the other hand the vibration
patterns of the string…? The latter would then be reduced to 5. ?

In our 5-dimensional model we could imagine the 11 dimensions derived in different
ways:

a) 10 dimensions (without Time) in some way expressions for the sum of "outer poles"
in d-degree 4 (re-identified as Direction), what we have called the "**E-number**".
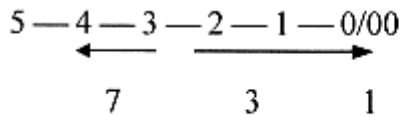   D-degree 0/00 of Motions as base for the Time concept in the standard model;
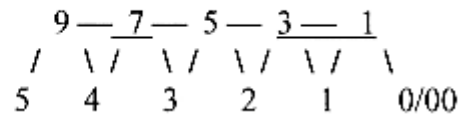motions as transformations of d-degree 5.
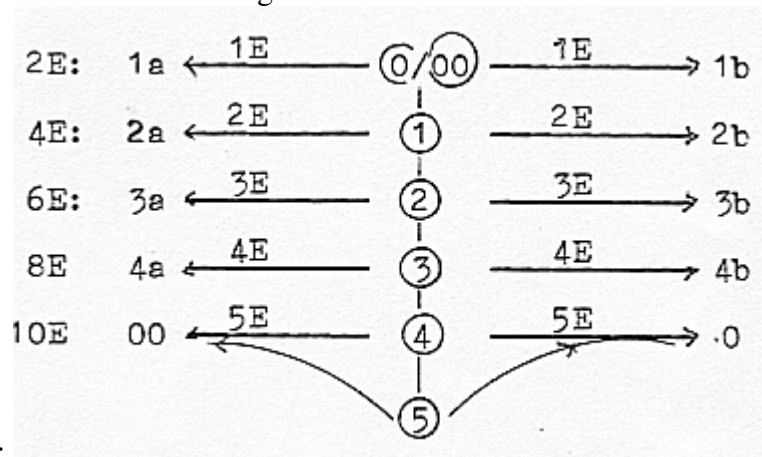
   Sum of poles:

The number 10 then transformed to 4 + 3 + 2 + 1 through d-degree steps, values of the
half axes; the other branch of half axes then ignored, connected with $E = -mc^2$?

b) An addition in a cumulative way ?:

$$5 — 4 — 3 — 2 — 1 — 0/00$$

$$7 \qquad 3 \qquad 1$$

c) Superposed level ?

$$9 — 7 — 5 — 3 — 1$$
$$/ \quad \backslash / \quad \backslash / \quad \backslash / \quad \backslash / \quad \backslash$$
$$5 \quad 4 \quad 3 \quad 2 \quad 1 \quad 0/00$$

With the view of debranched d-degrees in first steps, we get $10 \rightarrow 8 + 2, \rightarrow 6 + 4$ in sums of poles.

In our model we have assumed the **external motions** to be just 4-dimensional in d-degree 1. But this refers to another concept or definition of dimensions than in the String theory.
   We have suggested vibration as the motion of d-degree 1 in d-degree 4, seen as a linear motion in structure, but without any notes on its direction.

Since each d-degree of structure in our model principally is possible to analyze in pure motions, according to our postulates, it seems quite compatible with the reference to the "E-numbers" here, the sums of poles in different d-degrees - and with the general view in the String theory.

In ST, properties as **Mass** and **Charge** are identified as different vibration patterns. (Unfortunately hardly anything more is said about that subject in the reference.)

We can point out too, the talk about "directions" of the vibrations in ST, representing dimensions, which seems consistent with the designation of d-degree 4 as Direction in our the 5-dimensional model here.

5. "Undeveloped" dimensions ?

The ST physicists are looking inwards in the sense inwards towards Microcosm. As they in several respects, from our point of view, seem to study our dimension chain from 0/00 inwards *. We could identify their dimensions as characterized by direction inwards, but only in this sense.
   Does that mean that the 7 dimensions they refer to are undeveloped, only 4 developed? Hardly a good term. (The vibrations of their strings must occur in something of an "external" world, however small.)
   They talk about both open and closed strings. Compare in our model the suggested polarity radial versus circular structures of d-degree 3, derived from directions outwards-inwards.
   The used scale cannot justify the word undeveloped. The brains of ST-physicists are very small in relation to Universe, but "undeveloped"?

* About the division 4 - 7 and outwards - inwards: Compare the "mad" idea about "**quark-numbers**" in our model in connection with **amino acids**: a number + 2 times the mirrored number, sum divided by 3 etc., the same operation repeated, give chains of numbers as loops, sometimes "point loops":
   A dimension chain as numbers for steps: 54 - 43 - 32 - 21 - 10, backwards 45 - 34 etc. Last steps 10 - 01:

$$(10 + 2 \times 01) / 3 = \textbf{4} \text{ from step 10 outwards}$$
$$(01 + 2 \times 10) / 3 = \textbf{7} \text{ from step 01 inwards}$$

6. Number 5 in ST:

There is not only the 10 room dimensions (Time uncounted): 2 times 5.

There were also 5 different versions of the String theory, which have showed up to be different aspects on the same things, the M-theory as a uniting one. And there are polarities, as for example inversions, among the versions. In these aspects and others it sounds as if the String theory could be developing as a relative to our 5-dimensional model here.

Associations go to the 5 versions of **"histones"** among amino acids, types of proteins on which the DNA spiral is rolled up.

7. Structural aspects mentioned in the reference:

All outstretched objects, which the String theory generates, are called "***brans***" (membranes): 1-brans are 1-dimensional strings, 2-brans are surfaces, 3-brans is outstretched in 3 dimensions etc.

There is a hint too that there could exist "0-brans".

In such general terms this seems quite compatible with our model here as a development inward towards higher degrees (and/or lower in step 1→0/00.

Note that one talks about objects here, not only motional patterns: strings united to higher degrees of structure. But in our model (as in ST ?) there is no clear difference, when motions are seen as polarizations of d-degree 1 and could unite to strings again.

If we could believe the illustrations in a TV-program, some open strings are attached in both ends to a surface. Which surface if we only had strings? It must be 2-dimensional membranes (2-brans) - formed by united strings? Compare in our model d-degree 1 with outer poles:

$$2a \text{———} 1 \text{———} 2b$$

D-degree 1 created by the polarization of d-degree 2, but in our model between complementary poles. (Nothing explicitly or clearly mentioned in the book about such a kind of polarity.)

The 6 extra ("undeveloped") room dimensions that the String theory demands and generates have to fulfill form conditions which the so-called *6-dimensional Calabi-Yau-rooms* do.
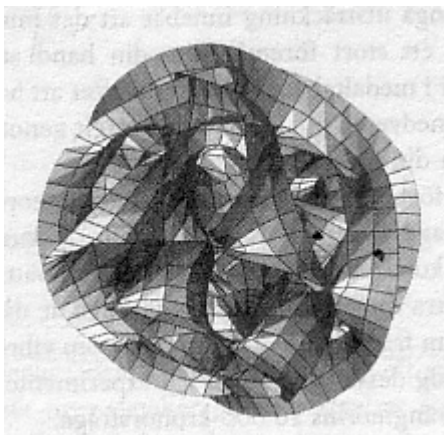
Calabi-Yau-room

From the book referred to. Original imprint: Jonathan Cape, London.

They look like very intricate balls with many inner surfaces — and with holes. Thus, it looks like a combination of complementary realities, "matter" as structure and "antimatter" as holes
- and in the number 6 of dimensions **it reminds of the sum of poles 3a and 3b in our 5-dimensional model**. Inner surfaces as a result of the combination.
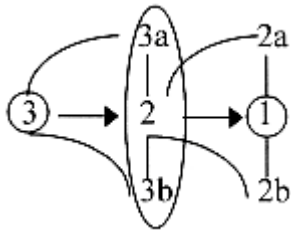

Fig Step 1-2-3

We have suggested "radial" versus "circular" structure as first very simple **geometrical descriptions** of poles 3b---3a. First criticism of this own model included the question how it could be possible to imagine this relation geometrically define surfaces of the 2nd d-degree! Forms as Calabi-Yau-rooms seem much more convincing in this respect. Without knowing anything about the intricate mathematics behind them, we just put a question here if they can be connected with the opposition radial / circular in the purely geometrical sense?

Besides such eventual polarities in the structure, we have the one between structure and holes, a polarity as an underlying = built-in polarity of next higher d-degree, if interpreted in terms of our model: "Radial" as connected with diverging Space (and negative curvature), circular connected with mass (and positive curvature), an opposition related to
$E = -mc^2$ and $E = +mc^2$.

Here (again) we could get vague associations to the *gastrulation* process in embryology: how many dimensions or so-called "independent" directions of growth do we have there:
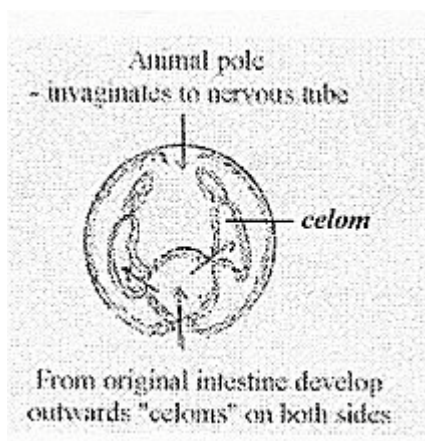

Fig Coelom

Another vague association goes to our suggested interpretation of **spin** 1/2.

About 6 dimensions, "undeveloped":
We could perhaps, in a very simple way, imagine an ordinary 3-dimensional coordinate

system with 3 axes but with 6 poles, 3 in positive direction, 3 in the negative one. This simple coordinate system folded together into something like a ball, a Calabi-Yau-room.

Seemingly without any connection with this complicated form (?), in the external, "developed" world, Einstein mentioned the relation between two 3-dimensional celestial bodies as a 6-dimensional system.

Calabi-Yau-rooms or the like are thought to exist in every crossing point of the space-time web. Thus, they remind of what we have said about "complex poles" in the original booklet behind this site:

Original poles of 5th d-degree, 0 and 00, may get increasingly more complex character towards superposed levels. That which on one level has the role of a 0-pole, may under its surface, on underlying levels, be constructed by combined 0- and 00-poles, in their turn on a still deeper level being combinations of opposite types etc.
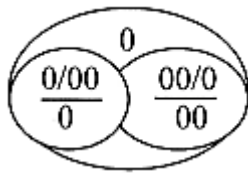

Fig Complex pole

And increasingly more directions will be defined.

   If we should look at Calabi-Yau-rooms as such complex 0-poles, it implies a development of the crossing points in the web. If one accepts the assumption in our model about level development that each d-degree step of a fundamental dimension chain can develop into new whole dimension chains, such forms as Calabi-Yau-rooms could be developed in step 1 — 0/00: a purely mathematical development by the String physicists - ? - or eventually realities.

   A last question mark about 6-dimensional Calabi-Yau-rooms:
Where is the th"undeveloped" dimension if there are 11, 4 of them developed?
   See below about the "String coupling constant" and the 10th room dimension.

8. Polarities - Dualities in the String theory ?

There are several such dualities in ST but, as it seems, without any ordering scheme.
We have to pick them out from sentences in different contexts and chapters of the book:

Structures ----------------- Vibration motions
Structures ----------------- Holes, as in the Calabi-Yau-rooms

Open strings -------------- Closed strings
Unlinked strings ----------Linked strings (winds themselves up on a
                                        circular dimension)
Strings -------------------- Anti-strings (as virtual pairs)
Right --------------------- Left type, "mirror symmetry"
Actual vibrations -------- Uniform "vibrations" of the whole string

Bosons ------------------- Fermions, appearing as pairs in the
                                        "super symmetry" theory
Odd d-degrees -----------Even d-degrees of holes (in "conifold
                                        transitions")
Pairs of forms Before ---After "conifold" or "flop" transitions
                                        through mathematical operations
Inversions: R ------------1/R (inversions around the Planck length as 1

in the different ST versions)
"Strong ------------------Weak" coupling

Some of these "polarities" are the same as in our 5-dimensional model or easy to identify as such:
   **Motions versus structure**, in our model as chains in opposite direction,

Chain of Motions, d-degrees: 0/00- 1 --- 2 --- 3 --- 4 --- 5
Chain of Structures, d-degrees: 5 --4 --- 3 --- 2 --- 1 ---0/00

and **Structure versus Holes**, as corresponding to mass — vacant space or $E = +/- mc^2$, from polarization of d-degree 4, giving the poles in d-degree 3. This one is of the complementary type for poles in the same d-degree as we have suggested.

So too is the polarity "**strings - anti-strings**", said to be virtual, occasionally split strings which then join again. We could interpret them as result of the polarization of d-degree 1 → 0/00, from lines to the d-degree of **motions**, with the "poles" we have called "motions to one another, from one another".

→*1a-1b as virtual strings*
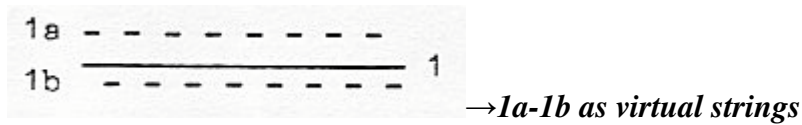
The windings these string - anti-string pairs in ST can form, as loops, seems to illustrate and agree with our naming of those poles.

(If we compare these virtual strings with steps of a walking person, the steps cannot be example of the mirror symmetry mentioned in ST? There is half a step of displacement between them.)

In other respects, many of the polarities listed above seems sooner to represent the "polarities" between different d-degrees in our model:

First the structural oppositions open/closed and **"unlinked - linked" strings**:
   We could associate these forms with d-degree step 2 — 1 in our model: strings as defining 1-dimensional lines, closed strings as defining a surface:
   The author is in his book mostly occupied with closed strings, the linked ones, winding themselves around another dimension seen as a kind of tube. (Or in very odd, inconceivable TV-illustrations climbing around as rings on the surface of these "tubes".)

 It sounds as if closed strings could be the ST forms of relations between d-degree 1 and one of its "outer poles" 2a or 2b (as inside-outside or similar complementarity), expressed in terms of **our model**.
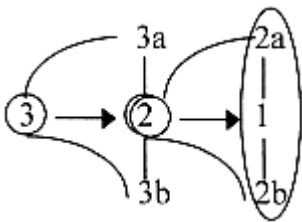

Fig Step 212 marked

Compare strings at the borders between holes and structures inside Calabi-Yau-rooms?
   Eventually the both types of strings could be seen as just smaller versions of the "radial and circular" poles of d-degree 3 in our model, but they don't seem coupled at all in ST (?).

   Some open strings were TV-illustrated as bound in both its ends to a surface. No polarity in this surface. Just a bad illustration?
   But what about the free, unlinked open strings? They seem to be only small, independent pieces of a line? What gives the tension for vibration?
   Such seemingly independent, freestyle swimming strings in an empty Universe are certainly not in agreement with our model. Looking as something between d-degree 1 and 0/00, the d-degree of motions. In our model nothing is "independent".

We can connect this opposition in our interpretation of d-degree steps, 2 - 1 and 1 - 0/00 respectively, with what is said in the reference about **mass**:
   Linked strings have a minimum mass of the structure, depending on the size of the radius and number of turns it is winded around the other dimension. The vibration gives a contribution. In our model **Mass** as a property is defined as through inward direction, 4a, to circular pole of d-degree 3.
   Unlinked strings have only the mass given by vibrations, without any contribution from the structure. It sounds like 1 d-degree transformed to motion in our model. (Mass of the open string structure and quantum mechanical effects cancel each other out.) About *fluctuations and quantum physics*, see below.)

In ST there is also a more gradual transformation than in our model between structure and motion: linked strings with big radii have big "link energies" and small vibration energies, while those with small radii has small link energies and big vibration energies.

What to say about the **d-degree of motions** in our model suggested representing the debranched d-degree in each step towards lower d-degrees, vibration, rotation and translation?
   Except the vibration directions, there is the uniform displacements (called vibrations too) of the whole strings, comparable with a 1-dimensional translation or pathway. Then there is the winding up on another dimension, comparable with a 2-dimensional rotation. (If many turns around, could they form 3-dimensional spirals - ? - as the planets spiral motions around the orbit of the sun?) And then we have the vibration motions, in one aspect a linear form; in another it could have the form of pumping outwards - inwards of a 3-dimensional structure?
   In ST, the directions of these vibrations are added as concept for more dimensions, (at least as it sounds in the vague descriptions).

Bosons and Fermions:
One obvious example of "dualities" in ST, corresponding to different d-degrees in our model, is the assumption that quanta of forces and of material particles (*bosons* and *fermions*) should show up in pairs, this according to the so-called super symmetry theory. The pairs should have 1/2 difference in spin. Such vibration patterns for boson-fermion pairs are said to appear in all 5 versions of the String theory.
   But no such pairs have been found among known particles! Yet, the prediction that these pairs exist is said to be a general property of ST.
   It seems as if there is something wrong with the idea of "super symmetry"? In our 5-dimensional model, with a view from inside outwards, from higher d-degrees towards lower, **asymmetry** is an essential aspect, deeply rooted in the first polarity: center - anticenter.

In our model we have assumed that each d-degree (of structure) is a binding force in relation to next lower d-degree, a lower d-degree a polarizing force in relation to next higher one. This means that forces versus material things is a question of relations.
   (Protons and electrons appear as forces too, on the level of chemistry, H^+ and e^-.)
   With these assumptions as postulates one should rather found "triplets", two "forces"

and a more or less material structure upheld by them. We can refer to the picture from the file about forces, under the headline *"Carriers" of forces*:
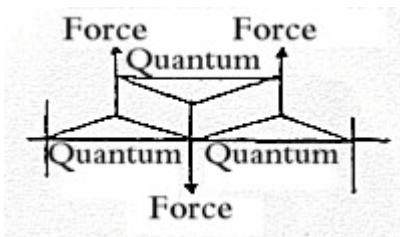

Perhaps the ST physicists have missed to identify something as the other "force", the energy of "empty space" or the like??)

   Should we perhaps find fermions constructed by two forces - 2 bosons? (2 "one-turn" spins added to a 2-turn = spin "½")?

Yet, there is a duality in our model too in the view on complementarity where each d-degree is secondarily characterized by first poles 0 and 00.

We have also the perpendicular aspect on the dimension chain with lower d-degrees representing 00 in relation to higher as 0, (as geometrically there is an infinity of lines in a surface, of surfaces in volumes…).
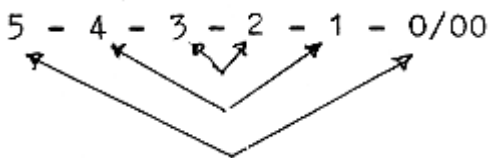
Could eventually such an aspect be involved in the talk about bosons and fermions as pairs?)


Two kinds of spheres in Calabi-Yau-rooms:
This is another kind of mix between different d-degrees. Two kinds of spheres are said to be imbedded in such complicated 6-dimensional rooms: one has the form of a "beach ball", (which indicates it is empty). The other one has the form of a tire.

   We can identify the "beach ball" as a 2-dimensional surface, enclosing a 3-dimensional volume, a form connected with d-degree step 3 - 2.

   The tire is the form that has been used to illustrate a 4-dimensional ball, interpretable as a 3-dimensional form enclosing a 4th dimension as structure of rotational motion. This indicates that the form is interpretable as connected with and enclosing d-degree step 4 - 3.

   Hence, we have a good bit of our dimension chain: 4 - 3 - 2; forms where higher d-degrees are built-in or "underlying" the lower ones, as "binding forces" in our own terminology.
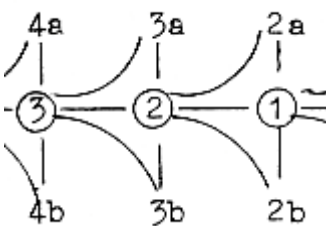
D-degree steps as a process in ST:

There are traces too of the concept "d-degree steps" of our model in ST, but we have to dig them out from stray remarks in the most difficult chapters of the book, from descriptions and illustrations most difficult to follow and swallow.

It concerns the so-called *conifold transitions* and *flop transitions*.

These are described as mathematical operations where different points on a form are united after special rules so that new forms are created.

For example: When a 3-dimensional form is pinched together and splits (or ruptures), it gets replaced by a 2-dimensional one, and the massless vibration patterns increases with exactly 1.

Besides the way of operating the forms, such a formulation seems to completely agree with the central concept of d-degree steps in our model. The new form looses 1 d-degree in structure, wins one d-degree of motion.

In another context, about *the string coupling constant*, the opposite direction, towards higher d-degrees, seems to be the case, eventually: When this constant is increased, in one of its versions, the structure is changing to a 2-dimensional membrane, "but this is not a structure that the string can vibrate in", "since it is locked to the structures of the strings themselves". It sounds as an increase with 1 degree in structure implies a vibration moment lost as built-in into it, expressed in terms of our model.

It's said too that such (or similar?) transitions between forms imply that the **number of holes of odd d-degrees** in one of the forms are the same as the number of holes of even d-degrees in the other. This too seems to indicate some complicated version of d-degree steps.

The author talks about "our conception of drastic typology transitions where the room raptures". In spite of ST being a so much more mathematically intricate and elaborated, scientific version of a model, couldn't we associate these "points where the space-time web raptures" with the d-degree 0/00, the 0- and 00-poles: first points (0), then the 00-pole which we have assumed as the first polarizing force in our model? The 00-pole, which as anticenter and "infinity" represents a non-structure and a phase "before" the space-time "web" is developed or the "non-structure" in the holes of the web?

In connections with the M-theory, uniting the 5 different versions of the earlier theories, these are mentioned with the word "**phases**".

This could indeed be still another sign that the String theory is on the track backwards in our 5-dimensional model.

(Compare starting from 0, from Zero, and starting from the anticenter, the 00-pole.

The A-base of DNA in the genetic code appears structured spontaneously in an appropriate solution, but in living organisms the way of construction of the A-base is very complicated, as taking it "the other way around".

About the mirror duality in ST, it's said that one part of those pairs gives extremely difficult calculations, the other one much easier ones.)

9. Fluctuations and Quantum mechanics…:

There is a lot of talk about furious, violent fluctuations in such things as energies and velocities, even in gravitation, in the microscopic world, within the area of Heisenberg's uncertainty principle and Planck's lengths. The "fluctuations" seem to be only a mathematical conclusion (necessary or not?) from this undetermined or indefinite area of quantum mechanics.
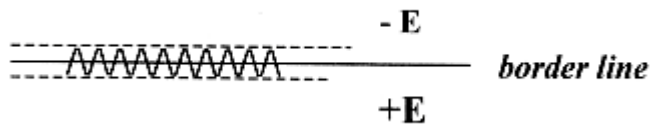
These fluctuations could in our simple model be interpreted as the motions out of the polarized borderline between +E and - E or 0 ----00:
   (Dirac, for example, says velocities can vary +/- c in this area.)

In some experiments of quantum physics there is a similar relation between Yes and No answers, particle or no particle, as if the measurement happened to occur when the fluctuating something was in the "-E"-area when the answer is no and vice versa.
   The String theory "smears" such fluctuations out to a line, and there is talk about strings that "wraps" a surface. Then we should be able to see 2-brans as "smearing out" strings, shouldn't we, in terms of our model as combinations of the poles 2a —— 2b, defining d-degree 1 and lines.

Three aspects on this:

a) The formulations, "smear out", "wrap a surface", seem to include the concept of *superpositions* from quantum mechanics, yet this word is not mentioned.
   A superposition, including two possible but opposite answers at a measurement (as particle - no particle), was discussed in our file about **Quantum physics** as a d-degree step from higher to lower d-degree. (If in a 2-dimensional coordinate system the y-axis "collapses" to zero, it can be viewed as "smeared" out on the x-axis, implying either of its complementary poles, as yes or now. A 2-dimensional surface or membrane in the String theory should be possible to interpret as a superposition to the strings?
   The formulations in ST about strings "wrapping a surface" seem more like the simple views in our model but in opposite direction: a surface, possible to analyze in terms of pure motions, can be created by an 1-dimensional line plus its motions (as "locked" or built-in)? We can refer to the notes on this in the file about **Einstein** too.

b) Another association to the violent fluctuations concerns our early suggestions that the properties **Mass** and **Charge** could be interpretable in some terms of "negative" acceleration and velocity "inwards," that is inwards towards a center, a zero point. As crashing cars get new forms along new coordinate axes in relation to their velocity direction.
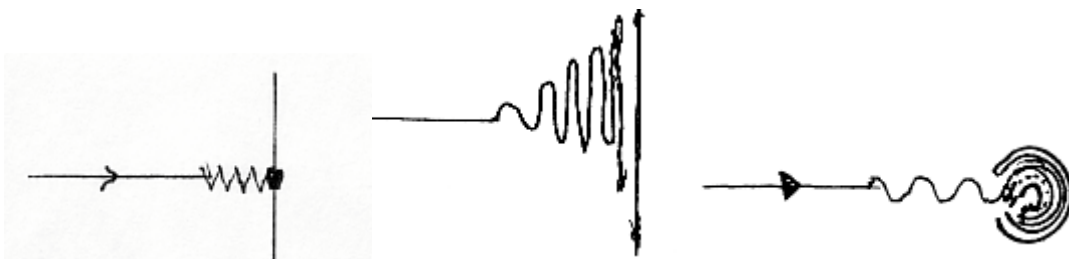
When physicists introduced the concept of particles as wave packets, they illustrate something of a similar idea, growing "fluctuations" - in our suggested interpretation the result of inward direction (towards a detector screen or the like).

c) The "String-coupling constant":
If rightly understood, the wild fluctuations in the area of indefiniteness should be connected with the appearance of virtual *string - anti-string pairs*, as polarizations of 1-dimensional lines in terms of our model.
   In ST there is assumed a number, the "String coupling constant", which should

express the probability that the polarization occurs and that the virtual pairs join again.

From our point of view it sounds rather odd that there should be the same constant in polarizing direction ("outwards") and in depolarizing direction of synthesis, in depolarization. Why? A structure of a certain d-degree (not only d-degree 1 of strings) is in our model upheld by a certain relation between the binding force of higher degree and the polarizing force of lower degree, the structure as a playing field between these forces.

Perhaps the ST-physicists are right, perhaps all energy in structures could be "lost" as pure kinetic energy if not the constant was the same?

But they haven't found this number. Changing the constant transforms the 5 versions or "phases" of ST into one another.

(Perhaps the number could be 0,2, the inversion of 5 in the last step $1 \rightarrow 0/00$!? Or $0/00$ ~5': $5^{3/2} = 11,18$. 11 dimensions + 0,18.?!)

What is indeed the difference between the "string coupling constant" and the relation between an inward gravitational force and outward accelerating force?


10. The Mathematics of ST - and "11-dimensional supergravitation":

Not much is mentioned in the book about the mathematics, and the whole String theory is still just a mathematical one.

Yet, so much is said:
1) It started with a 1-dimensional string and calculations with equations that already Newton could have written.
2) Then Quantum mechanics were introduced in these equations, with quantifications, probabilities, the uncertainty principle, fluctuations etc.

It sounds as if we could associate this approach with d-degree 4 and 1 in our model, then step $1 \rightarrow 0/00$.
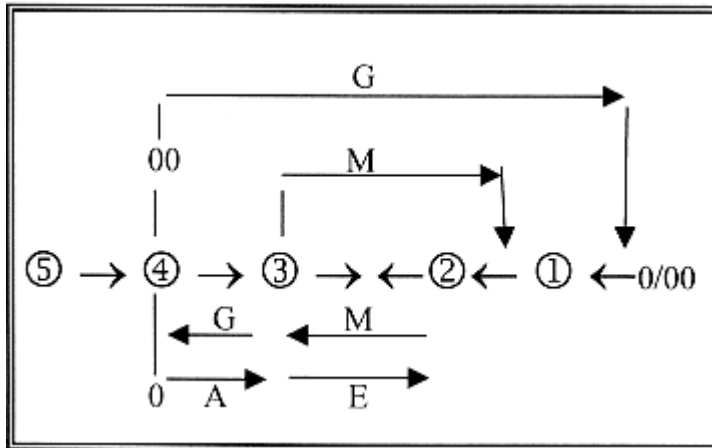
Newton's gravitation with a big G as inward direction from the 00-pole in d-degree 4, to d-degree 1, the string,
- and quantum mechanical aspects explored in d-degree step $1 \rightarrow 0/00$.

Then the elaboration of the theory inwards our dimension chain, towards 2- and 3-dimensional membranes and holes, meeting the 4th dimension as built into the Calabi-Yau-type rooms…

From one viewpoint it seems rather natural that they take the step from d-degree 4 to 1, since one d-degree is debranched in step
$5 \rightarrow 4$, according to our model. (But they avoid step $4 \rightarrow 3$ outwards ?)

(Compare the definition of dimensions in ST as independent "directions of vibrations": "Direction" as our name for d-degree 4, and Motion out of step 1 →0/00. "Vibration" as a 1-dimensional motion structure in d-degree 4.)

We have to repeat that the ST-physicists' occupation with Gravitation reasonably should have touched on the complementary FA-force, related to Vacant Space, but such a force isn't mentioned. (Compare G-A and M-E in the figure above, see **MEGA-fields**.)

   In their occupation with strings and d-degree step 1→ 0/00 (as we have interpreted it here), they should reasonably have much to say too about the **Weak Interaction force**, with the aspects on this force we have in our model. (Perhaps its involvement is taken for granted in the "Standard model" formulation of it.)

   Here some more versions of figures from earlier files to help visualize these notes:
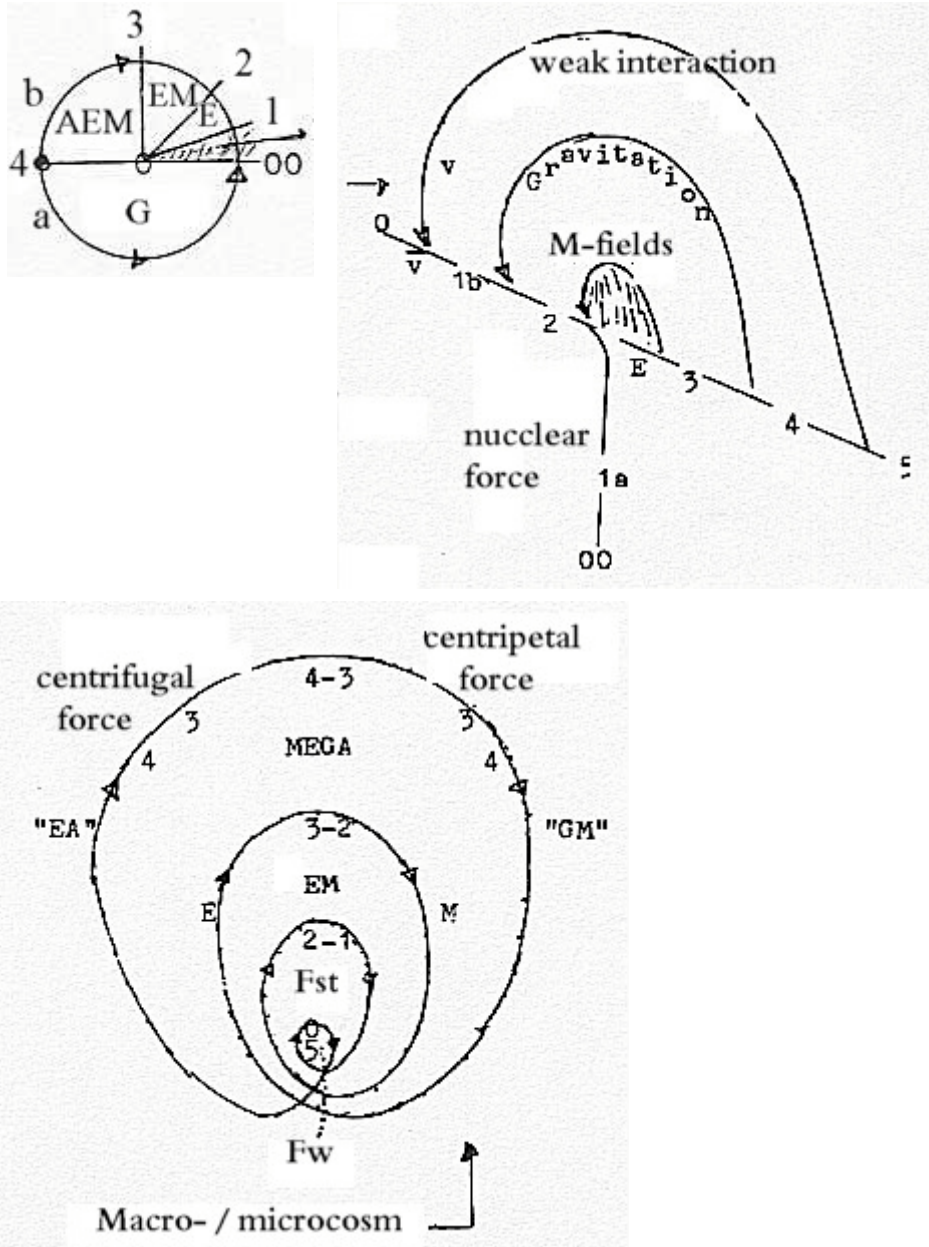
The 00-pole and 11-dimensional Supergravitation:

In our model the 00-pole of d-degree 4 are meeting the complementary 0-pole in last "d-degree of Motion", 0/00. The 00-pole as an inward directed vector field, identified as a gravitational force, is redefined through "motions from each other" in the end of the dimension chain.
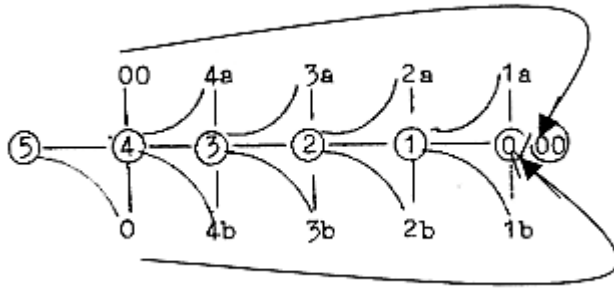
Fig To 0-00

An 11-dimensional **supergravitation**?

This supergravitation is said to show up if one increases the string coupling constant to a number much bigger than 1 in one of the 5 versions of ST. It's said that no one knows what this "supergravitation" should be!

We have described the d-degree 0/00 as the transformation of d-degree 5; also as 5' a starting point for new dimension chains.

(Compare poles 1b — 1a, defined in our model as "motions to and from each other":
  1+1 = 11, to quote some rather unknown poet in the 60th !
Motions from each other (pole 1b) define a distance, ~ a line: $10^1 = 10$. (Room dimensions.) Motions to each other (pole 1a) define a point: $10^0 = 1$. (Time dimension)
  "Time" or "Space-Time" = "Supergravitation" ? !

Or perhaps this theoretical 11-dimensional supergravitation implies that the ST-physicists, via the degree of Motions, arrive directly to d-degree 4 with poles of the 5th d-degree, "E-number" sum 10 (+ Time = 11)?
  If rightly understood this "supergravitation" is connected with "super symmetry? If so, we could state that in our model we have a very simple symmetry in d-degree 4, where no secondary directions are defined yet but the inward - outward ones.

In our model the 00-pole as anticenter can be found in every d-degree of structure.
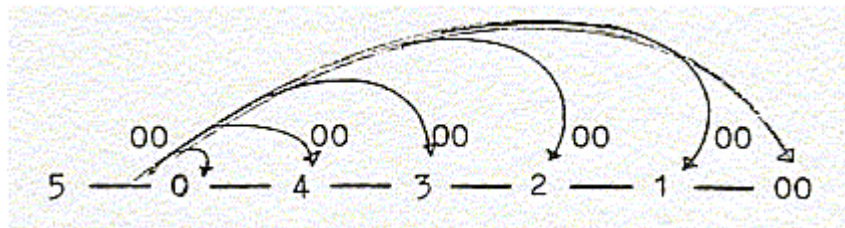
There is always a surrounding to a "unit", defined as such by an enclosed center, the surrounding by an excluded center.
  We can think of the 0-pole developing stepwise through the chain and in combination with the 00-pole from outside forming structures of different d-degrees….

We have also the view on a dimension chain as "haploid gametes", then written:

$$0 \to 4 \to 3 \to 2 \to 1 \to 00.$$
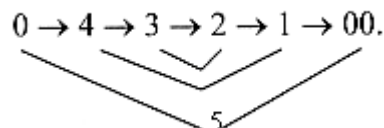
 It seems a bit curious that **the appearance of a 2-dimensional form** should be connected with these calculations, leading to "supergravitation". The condition for this in our model should be that the calculations were on the way **4 → 3** of d-degree steps, polarization of gravitation and acceleration outwards (FG and FA), and a second d-degree debranched in that step, meeting "the other way around".

   Note that this 2-dimensional "bran" seems to be viewed as implying the **7th** "undeveloped" room dimension we asked for above about numbers of dimensions. (4+3 = 7 !)

How to unite the double aspects in our model on the 00-pole being first fundamental polarizing pole but also in next step an aggregating one as gravitation? (The 0-pole binding, integrating - and polarized.)

Motions "from each other" defines an anticenter, a (new) 00-pole, a polarization, which should be responsible for the separation of poles 2a and 2b of d-degree 1, of the "strings", the tension in these. Upholding them as linear structures. But the structure of the diverging motions is an inheritance from the 0-pole of the outward directed vector fields in d-degree 4.

   Motions "to each other" defines a (new) center, a 0-pole, which could appear as the contraction force in the strings. The motional structure, however, is an inheritance from the converging gravitational force or vector fields in d-degree 4. This is the "pole exchange" from d-degree 4 to 0/00, vector fields to motions. All according to our model.

   With this duality (and a little piece of Time between, as "one way direction"?), we get the windings of the ST-physicists' strings.

$$\leftarrow 00 \rightarrow | \rightarrow 0 \leftarrow | \leftarrow 00 \rightarrow$$
$$\text{time} \qquad \text{time (?)}$$

(But how do "motions from each other" ever meet again!?)

So the question about "super gravitation" could be if it is the divergent 1b-pole, creating a 00-pole, in the d-degree of Motion, that points back to the vector field of pre-material Gravitation in d-degree 4 and its "field lines" ? Back, or forward to Gravitation in a new chain.

The R - 1/R duality could perhaps fit into this context. It implies that when the circular size of a linked string shrinks down to 1 (as the Planck length), Universe decreases, but on the other side, shrunk still more, it begins growing again. The ST-physicists gets the same Universe on both sides of 1, an inverse relation. (0/00, the "d-degree of Motion", equivalent to 5 or 5'.)

Additional remarks:

11) The efforts to unite Gravitation with Quantum mechanics:

The difficulty to unite the general relativity theory of gravitation with quantum mechanics was the cause for the string theory. Operating with particles as points (0-dimensional) gave "absurd" infinities of possibilities. These infinities, redefined as anticenters, are quite natural and necessary in our model. Gravitation is identified as the vector result of that "infinity", for direction inwards. There are two statements here worth to note about why the difficulties arose:
   1) The physicists tried to quantify the gravitation, in *gravitons*, the assumed quanta.

2) The physicists felt obliged to *treat particles as points* in order to retain the possibility to find them somewhere within Schrödinger's type of wave functions.

1) Suppose that Gravitation from the 00-pole represents continuum, the 0-pole the quantified scale in this opposite pair of duality. Suppose then the **graviton**, not found yet, is not a quanta of the same kind as the quanta of later steps in the dimension chain.

   Compare the calculated spin: With Hawking's description **spin** numbers says how much we have to turn a quantum for it looking the same again. We could translate it to a degree of complexity: Spin 2 of the "graviton" means 1/2 a turn, spin 1 means 1 turn, 360°, the circle around, spin 1/2 means 2 turns, 720°.

   Why should such a structure of just half a turn (hardly any rotational moment) appear as a quantum with something of an enclosed center ? 180°: it sounds as if the concept "field lines" should be a more appropriate association.

   Nor have magnetic monopoles been found, quanta of the magnetic fields. It could be the same story with them - ? - with our view that **M-fields** are characterized by the 00-pole in next step, as a son of Gravitation. (Mother the FA-force.)

2) About wave functions and squared amplitudes as possibilities to find a **point particle**:

   Suppose there is no particle in the waves, suppose the assumed "particle" just is in its wave "phase", (perhaps fluctuating between inside/outside the wave surface?), the energy spread as in the amplitudes okay, but only becoming a "particle" when the wave breaks, meeting resistance as through a measurement ?

   It seems to be something wrong with the "probability concept" when it comes to finding a point inside a wave, before it breaks? Of course there is an infinity of "points" in the mathematical sense in something spread out as a wave. (!?)

   (Where do we find the words when human beings talk, before they reach the brain of a listening receiver?)

12) Mass and Charge properties:

As said above there isn't much mentioned about these concepts, besides that they are defined by different vibration patterns and the note about mass division between structure and vibration patterns in linked strings.

   One statement seems in very general terms to agree with our simple identifications of mass and volume as poles in d-degree 3: It's said that the mass of a "3-bran" is proportional to the volume it encloses.

   In another context we have the statement that Mass is inversely proportional to the string-coupling constant for objects of higher than d-degree 1. The smaller this number is made, the bigger the Mass becomes. Here it sounds as if this constant could represent only the possibility for polarizations of one d-degree, not the opposite?

   Inversely, however: when this constant was made much bigger than 1, the super gravitation raised, which is stated in another context.

   Can we in these opposite operations find an evidence for the inverse relations Gravitation - Mass which we have seen as a probability in our model, step 4 →3 as an inversion ?

   Compare: Radius of stars on the main series is directly proportional to the cubic root of their masses, while the radius of white dwarfs is inversely proportional to the cubic root of their masses ?

Charge is connected with EM-fields in usual physics. A main suggestion in our model is that this property is a 2-dimensional one, if interpreted in relation to Mass as a 3-dimensional one. Nothing is said in the book about Charge, which we could compare with this suggestion, and it seems that the author sometimes uses the concept of "charge" in a wider sense.

It's mentioned that charge can be divided in much smaller fragments of 1 than +/-2/3 and +/- 1/3 of the quarks, for example 1/13 or 1/53 (!), if a linked string winds itself up on another dimension in more and more turns. Nothing about the background idea if any.

From our point of view and interpretations of **Forces, Mass** and **Charge** main questions here is

a) if it's possible to derive Charge as property from the Mass property (as 2-brans were derived from 3-brans through conifold transitions in ST, and

b) if Kaluza's derivation of EM-equations from Einsteins's Gravitational ones may lead to a recognized derivation of EM-fields from "G/A"-fields, according to the suggestions in our model here, and

c) if the polarization of 2-dimensional membranes (as into inside - outside, convex - concave, (surfaces of holes / membranes) can give rise to strings ?

13) Why the enormous smallness of strings?

Strings of ST is thought of as about 10^{-35} m, that is hundred million trillions smaller than protons in atom nuclei. Is it really necessary? Why not blow up the scale?

In our model we have taken as a **postulate** that the same patterns of structures show up on superposed levels, and very much points towards that. Why not in the String theory if it has a justification? What about "field lines" in relation to celestial bodies in Macrocosm, what about processes in biology - and protein structures in biochemistry?

In our model, as said before, there is a chapter about level development (not yet as a web file). The assumption there is that each step in a fundamental dimension chain can develop to whole new chains, as new loops of energy are created in the modern world. A somewhat related idea in ST is mentioned, of possible new bubbles in each point… But why should that lead to other Universa? Why not see them realized in this world!

14) The 7th "undeveloped" room dimensions and fatty acids:

With 11 dimensions, one for time, there is the usual 3 "developed" ones, + 6 in Calabi-Yau rooms, which gives 9. The 7th "undeveloped" space dimension seems to develop during certain operations with the "string coupling constant"?

Compare the files about **Fatty acids** and **1/7,** a curious (or "mad"?) idea that the periodic number eventually could be a mathematical principle behind the synthesis of fatty acids - and collagen? This periodic number has certain number relations to fatty acids which are building up cell membranes, "2-dimensional" on a higher level. A couple of them here:

Lipid membrane → d-degree of the forms

2a
①
2'b
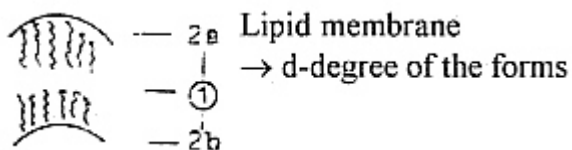
[Cf. the quotient proton/electron:

$$(0,428571..)^2 = \underline{1836,\,7346\,9387}\, . x\, 10^{-4}$$

$$= 4 \times 1836,7346 \dots etc.$$

$$42,85^2 = 1836,12\,25 = p/e.]$$

```
     00 ~5a    4a     3a     2a    1a
        |       |      |      |     |
   5  - 4  ──   3 <──> 2  -  1  -  0/00      Dimension chain
        |   ┊   |      |      |     |
     0~5b  ┊  4b ---- 3b     2b    1b
           ┊
        10 ┊   8 ---- 6     4      2   Sum of poles = "E"-numbers
  A-numbers: ┊       86 = Malonyl~
           '---- 43 = Acetyl~
```

```
 Period 3/7:    0,  4 2 8 5 7 1
      /
    3 /2               42 + 85 + 71      │⌐ 283 = fatty acid C18   charged
      \                   28 + 57
 Period 2/7:    0,  2 8 5 7 1 4
                    28 + 57 + 14        │⌐ 255 = fatty acid C16   charged
                       85 + 71
```

Concluding words:

It's possible, as showed above, to find several similarities between the String theory and our model here, but only through searching for them in many disparate contexts and separate sentences in this reference. The set of concepts used by the theory seems also to be one of its own to an essential extent.

   The whole theory seems still entangled in some complex form of "Calabi-Yau-rooms" and the Universe presented is everything but "elegant".

   But "Universe" in Latin means a unit inverted, so beginning with the inverted form seems justified.

   However, one popularized version of the String theory seems to be one with an infinity of loose, individualized, independent, free-swimming, vibrating strings in an empty something, which is certainly not the case and totally contradictory to our model where everything is related — and relations.

<div align="center">*</div>

0 and 00 - singularities and the problematic infinities

A little stirring in the conceptual soup:

The model here departed from a very elementary geometrical view on Big Bang as a point (Zero) in the sense of a first center (0). Big Bang as a triple point between metaphysics, mathematics and physical concepts.

The complementary pole (00) becomes really "*undefined*"- by definition.
The 4th dimension degree (d-degree) as Direction(s) has here been regarded as created between these "poles".

In later years and decades the Big Bang theory has been established as proved, and black holes as consequence of collapsing stars has been intensely discussed.
   Singularities, Zero-points and infinities as 00-poles are incorporated as concepts in physical discussions.
   Yet, it seems that physicists still find it difficult to accept infinities when they appear in their functions. They are regarded as "absurd" answers in their calculations. The String theory was developed as a way to avoid such "absurd" answers when particles were treated as points.

In which sense if any are such answers absurd?
All right, certain kinds of physical calculations may demand that both entities in a relation be well defined within limits.
   However, methods or conceptual structures to interpret infinities when they show up, not neglecting them, seem necessary to develop from the viewpoint of our model.

Two first things to say:
- The redefinition in our model of "infinity" to "anticenter" implies at least that infinities get indirectly defined through their complementary poles, representing centers.
- The 5th dimension degree, here introduced for the Entirety, polarized into poles 0 and 00 makes a difference. The fact that established physics only count on 4 dimensions seems to be an essential part of the problem. The infinities said to appear among the equations in Einstein's general relativity theory may just point towards one such not recognized higher d-degree.
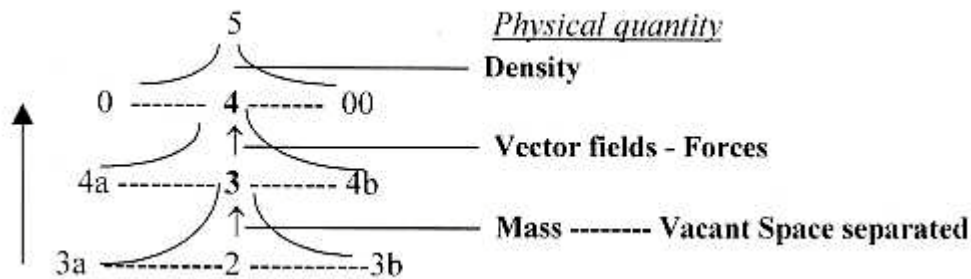
Black holes:

To begin with the singularities connected with theories about "black holes":

"*Space-time breaks down*" in black holes. This statement or description becomes quite natural if we replace the concept of a "4-dimensional space-time" with the 4-dimensional vector fields in our model, defined through the polarization of the Entirety into the poles 0 and 00. (Of course Space is created through the Big Bang, doesn't exist "before", and the concept "before doesn't exist either.)
   The replacement implies only that a formulation in d-degrees 3-2-1-0/00 (0/00 for Motions, here Time) are raised (= deepened) one d-degree to 4th d-degree as non polarized At the poles all structure disappears.

In words from Hawking: singularities are found where space-time has a beginning or an end. 0<===4===>000 (4 for space-time). That's obviously at the "outer poles" 0 and 00 of d-degree 4 in our model.

(This picture should be turned upside down.)

In other formulations:
"The singularity is the point where the whole mass of the black hole is gathered and crushed to infinite density".
   "Space-Time breaks down and a so called singularity is created. The density of matter becomes infinite in a place which has no extension".

   Mass→Gravitation → Density:

First, why talk about **matter** or **mass** in this context? The problem some authors find in this occurrence seems to depend on their wish to limit themselves within the frame of a 4-dimensional world and the concept of Mass - which in our model isn't identified before d-degree step 4-3.
   That the property of mass as a structure breaks down is quite natural at the poles of d-degree 4. An analysis in terms of a change in dimension degree seems necessary to introduce.

Second, it's said that **gravitation** seems to grow towards infinity (00) inside black holes. We have identified the vector fields when polarized as FA, the outward acceleration **force** (cf. Space, now recognized as expanding) and FG, Gravitation as the inward acceleration force. With the definition of gravitation as the direction inwards, (Vconv) this growth sounds natural. One aspect on this infinity is the infinite number of directions towards a point. Observe that the infinity here concerns the "strength" of the force.

Third, "density becomes infinite":
Density is in our model suggested as the physical concept in d-degree step 5 - 4. In next step polarized into Mass and Vacant Space (as $E = +/- mc^2$).   (Density as Mass/Volume here implies that a fractional expression may be interpreted as a relation of complementarity.)
   The suggestion is well in agreement with statements about the conditions in black holes. Density of vectors at a Zero point becomes infinite.

Density, it's said too, is inversely proportional to Mass squared:

$$D \sim 1/M^2$$

Expressed in this way it may seem odd that Density grows when Mass is reduced.
   Yet, accepting that the formula conceals a border between d-degrees and implies a relation between higher and lower d-degree, it's more understandable. (Note the inversion too, see below.)

Singularities of opposite kinds, 0 and 00?

The suggestion that Big Bang was a singularity of the 0-type and black holes are singularities of 00-types seems very natural from the viewpoint of the model here. (It is attributed to Weyl [Wikipedia].)

   The 00-pole has here also been interpreted as manyfold in relation to the 0-pole as a unity. Black holes as the death of big stars are naturally a manyfold

In terms of forces:

Singularities are presumed as points "since no known forces can resist the enormous force created when stars collapses".

   The poles 0 and 00 are identified as first binding and polarizing forces in d-degree 4 in our model. Which connections exist between the infinities and singularities in physics and these conceptual definitions?

   In the theories about black holes the anti-gravitational force FA is regarded as absent. Gravitation, the force of the 00-pole in this model, when acting alone in the collapse of stars, obviously acts as a *destructive* force since mass disappears. Hence, black holes could be regarded as results of Gravitation in its most primary form. Aggregating but fragmenting or de-structuring.

   It implies that the property of Mass also, not only "Matter", need a factor from the

FA force for its construction. (Cf. our suggestion to use matter for the atomic structure developed in d-degree step 3--2, mass as concept for the deeper property developed in d-degree step 4→3.)

[At the same time the singularity may be interpreted as a secondary defined Zero-point, as we have assumed a "pole exchange" in the last step of a dimension chain where motions inwards, "towards each other" indirectly defines a 0-pole again. This 0-pole could be attributed the property of a binding force of secondary order (equivalent with what Weyl calls of "00-type"?.

   In that case we have connected the interpretation of black holes with motions, with the last step in the dimension chain instead of aspects in d-degree 4. (Cf. d-degree "0/00" as the meeting of the outer poles in d-degree 4)]

About curvature of space-time:

A factor that may complicate the physicists' analysis is their wish to connect gravitation with curvature of space. Even in d-degree 4.

   In our model a point as the singularity of Big Bang is the opposition to an infinity and gravitation in d-degree 4 is identified as a radial inward directed vector field - and curved space is introduced first in step 4→3.

   In the view of astronomers and cosmologists of today a point represent an infinite curvature, a really self-centered infinity! Such a definition points to the alternative analysis at the end of our dimension chain.

   (Rotating black holes may justify aspects from the lower d-degree. Cf. about **rotation**.)

As to this curvature:

Would it be possible to replace a gradually increased curvature with repeated steps from an *Euclidean* to an *elliptic* geometry? (See file "**4-3 III-IV**", No. 5)
   An Euclidean plane (as an angle) may be represented by an elliptic line, an Euclidean line by an elliptic point. Applying this description of elliptic geometry in relation to the Euclidean one as a stepwise lowering one d-degree, we may from volumes arrive toward a point in 3 steps.

Space and Time "shifting place":

According to one statement "Space-Time becomes so curved that space and time in some way shift place". It sounds as if we in that case had something remembering of what we have called a "*pole exchange*" in last step of the dimension chain in our model, where motions from each other define anticenters, motions inwards, towards each other, define centers. (Distance and Time as entities in last step.) In connection with the view on dimension chains of Motions and of Structures as in opposite development, we could perhaps imagine such a change.

D-degree of Motions: 00/0   1   2   3   4   5
D-degree of structure: →5 →4 →3 →2 →1 →0/00

In other words: space becoming the imaginary factor (instead of $\sqrt{-1}$ for Time), Time or Motions (d-degree "0/00") realized - perhaps connected with the wild fluctuations of quantum mechanics in microcosm? (Space as "imaginary" could perhaps be thought of as corresponding to human memory, rooms inwards, the world in dreams when a person sleeps and represent "an entirety" in itself.)

What happens at the singularity in black holes - if anything?

Is there any possibility of transformations in the imagined centers of black holes? Any hidden connections with other parts of Universe? The most logical with our model in mind would perhaps be a transformation to the opposite force FA the outward acceleration force, a hidden connection with expanding Space? With the world of negative energy ($E = -mc^2$)?

Apart from black holes:

Definitions:

Within mathematics the concept poles are used as in our model (also replaced as "partial structures").
   A point Zo is said to be a pole to a function if the limit of the function goes towards 00 when Zo goes towards 0. It's a simple expression for the polarity in d-degree 4 in the dimension chain.

Within physics a singularity is a point in time and/or space where one or several physical entities are undefined "*since their value becomes infinite*".
   Here the connection between the properties "**undefined**" and "**infinite**" is expressed - with the explanation that "*we don't know any laws of nature which are valid with infinite values on physical quantities*".

A general question: Could some of the problems with singularities and infinities depend on a mix-up of different kinds of infinities and of different aspects or definitions of "singularities"?

One may ask:

What is the essential property of an infinity?

· That it is immeasurable?
· Infinite in number of something?
· Or just unlimited?
· Or just undefined or badly defined just in this special relation to some other quality?
· Or the reference to its relation to a center, a 0-pole, its property as an "excluded center" in relation to an "enclosed" one? Its character of "anticenter"?
· Or the event that some zero point has become inverted?

The several different kinds of infinities and definitions seem unclear or disputable.
   Infinity in numbers is one thing, but there are essential infinities as anticenters that don't concern numbers. Infinities in "*strength*" of forces, in the property *Mass* or in *Charge* are hardly of the same kind; the only common property may be the that they are immeasurable.

Some other examples:
- 3rd degree is undefined for an existence in d-degree 2. We have that higher d-degree is undefined in relation to a lower one, but it could hardly be described as infinite?
- In simple geometry a lower d-degree represents infinity in relation to or included in the next higher one - as a potential number of surfaces in a volume.
- A spherical surface is closed and measurable as such but unlimited, in this sense infinite.

We could add a question if singularities may have any connections with the "superpositions" in **quantum mechanics**?
   A superposition is perhaps not infinite but undefined with respect to 2 possible answers. However, on the x-axis in a coordinate system the y-axis is undefined and could be regarded as representing an "anticenter" and as such all possible but potential values, including +/- infinities. Equivalent with the 3rd d-degree in relation to an existence in the 2nd d-degree.
   If a superposition when released is regarded as a collapsing y-axes, giving answers Yeas or No, it's equivalent with probability 1 or 0. And probability is perhaps the only physical concept that is infinite at a well-defined number 1 (!).

What does a probability on the other side of this border 1 imply? It's said that physicists have met such peculiarities. In connection with Schrödinger's wave functions the probability to find the electron somewhere is the amplitude squared. Then the amplitude must be below 1 (something) in order not to give probabilities >1.
   Could this problematic infinity be self-inflicted? Depending on some wrong border to the possible amplitude? Or on the other side of 1 represent something that already has happened? Backward in Time?)

Does the redefinition of infinity to anticenter imply any contribution ?
It follows from the starting point of Big Bang, all right, but then?
   Infinity leads the thought to size, immeasurable things, while the concept anticenter allows much broader references and points toward a relation.

Transformations:

Everywhere where the 0-pole becomes the denominator, these difficult infinities must show up. There must be something wrong with applying this mathematical convention to physical realities, since the Zero point and Big Bang naturally is a common "denominator" for everything in Universe.

It seems necessary to analyze what a mathematical fractional number really corresponds to in physical terms. (Cf. *fractals*.)

The natural thing would be to see them as relations and indirectly arrive at new definitions.

Again, within mathematics a singularity is an undefined point in a curve, a surface or else analytical function: a point as a break, a corner or such things. It's classified as undefined since some other mathematical concept, whatever it may be, isn't defined in that point.

A simpleminded view would be to look at these points or corners as polarizing ones, indirectly defined through the continuous or analytical parts that they divide. (Why should every concept which physicists or mathematicians invent have to exist in all other contexts? Not to exist is also a property!)

Such points or singularities of different kinds are related to structural changes as *phase changes* or to what happens at *bifurcations* (with reference also to Hirsch and Smile). In terms of our model reasonably with jumps, with dimension degree steps, may it be fractals or whole steps.

In the latter case it would imply a change, a transformation to another physical quantity. We have the general truth that concepts only can be defined through one another. Hence, it's quite natural if physical concepts will have to be transformed into one another for a definition.

Two possibilities:

Yet, there are two possibilities: with respect to a dimension chain: in the model here:
- Either to find the singularity and infinity of some entity as pointing out a relation to the complementary pole in the same d-degree, or to identify it as expression for a change in d-degree as in a phase shift.

The interpretation may be confused by the general ambiguity regarding the 00-poles in the dimension chain: Each lower d-degree in relation to the higher represents geometrically an infinity. We can also regard a whole chain as "haploid", as a development from the first 0-pole to the 00 at the end of the chain, the 00-pole debranched to a surrounding, an anticenter, in each step of the 0-pole towards lower d-degrees.

At the same time - or when the dimension chain is regarded as "diploid", all complementary poles in lower d-degrees have inherited some features from the 0-and 00-poles respectively. There is some character of the opposition center - anticenter in each degree (as Mass versus Space, Electric versus Magnetic fields, as protons versus electrons.

Furthermore, we have assumed as a general view that the anticenter pole, as the "surrounding", is stepwise built-in during the development of the 0-pole towards higher levels. Hence, we can expect infinities built-in everywhere in our ordinary world.

It's perhaps not strange then that physicists some decades ago found that the positive **charge** in nuclei seemed to rise towards infinity inwards the center. (Charge in this model regarded as a 2-dimensional property in relation to Mass as 3-dimensional.)

The found infinity of charge could depend on a mix of d-degrees. It could imply that

the analysis should be moved one step deeper to the physical quality Mass, - or outwards put in relation to the physical concept of Distance - in order to get defined values?

 (Cf. the convention to put the negative charge of the electron to 1, and the partial built-in negative charge -1/3 of one quark in the proton in the quark theory. And the family connection assumed here between negative charge and FA and Vacant Space in higher d-degree.)

Inversions:

A usual, simple illustration of a singularity is the point x = 0 in the function
y = 1/x.
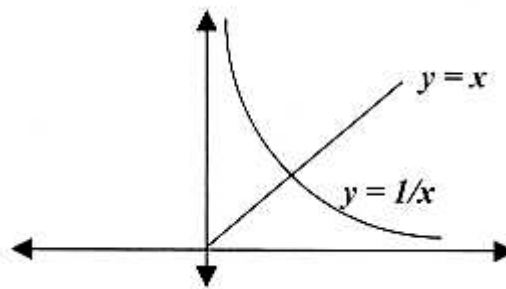
This is the inversion of the function *y = x,* of a straight line from the origin, a "radius".

 One aspect is the value of *y*, rising towards infinity when *x* approaches zero 0. Infinities are of the asymptotic kind. The jump to an interpretation of what these coordinate axes eventually represent in physical concepts seems to be appropriate.

 Another aspect could be expressed as the opposition between "excluded" and "enclosed" center, derived from our first polarization in 0 and 00.

 From the viewpoint of first origin in the coordinate system it's the curve that represents the excluded center, connected with infinities, and the origin (x = 0) with the real "enclosed" center. However, from the viewpoint of the curve, the origin x = 0 becomes an excluded center, and the curve of the inverted function, indirectly defining a new center, represents the enclosed one.

The functions *y = x* and *y = 1/x* illustrates geometrically the complementary poles *radial - circular* which we have assumed as the polarity from polarization in d-degree 3.

 (See **presentation** of the model.)

Geometrically it's possible to identify inversions of different kinds.
- The *negative and positive halves of the coordinate axes* may be regarded as inversions of each other around zero 0.
- *Directions inwards and outwards* may be regarded as inversions in a similar sense - along the vector lines.
- A part of a curve, inverted along a tangent, would represent the complementarity *concave - convex*. Equivalent with an inversion of the viewpoint: from outside to inside.

Hence, the complementary poles in our dimension chain may be regarded as inversions - geometrically.

 We could repeat here that one of the poles (or partial structure in all d-degrees has inherited some feature of infinity or anticenter.

Connecting such different inversions with dimensions and dimension degrees, it could imply that also simple inversions of numbers as such around number 1 could content a possible relation between them in a physical context.

Generally it seems necessary to identify "around what" the inversion occurs, sometimes possible to express as "on the other side of a border".

One could conclude that it should be possible to handle some infinite factors through an analysis of the inverted form and the kind of inverted relation to the complementary pole. If not going underground - to higher d-degrees.

Concerning the **physical** quantities connected to the poles, in which way if any could these be regarded as inversions of each other: protons and electrons? Mass and Space ? E and M? FG and FA? Surely not in a simple manner.
   A vector field or force as outward directed should certainly have to be turned or "inverted" through the 5th dimension degree, the entire Universe, to become an inward directed one.
   And we can go on assuming that Mass as a property should demand 2 such inversions or reflections, also the one between positive and negative Energy ($E = +/- mc^2$) to disappear as Mass and reappear as empty Space.
   What physicists call antimatter as antiprotons versus protons demands probably 3 inversions through the higher d-degrees.
   Protons and electrons as antimatter to each other on another level and grandchildren of FG and FA surely demand 4 inversions to transform to their complementary pole, the change in mass relation included.

In general words it sounds reasonable that transformations between complementary poles demand reflections as inversions in a different number of steps.

How does this assumption agree with the suggestion in files about **Mass** and **Charge** that these properties could be interpreted in some terms of negative (inward) and inverted acceleration (-1/a) and velocity (-1/v) respectively? It may agree in the case of Mass but Charge should need the addition of some more complex operation.

(As to the relation between reflection and inversions, compare about quaternions in **file 4-3: V-VI**.)

In lower d-degrees where degrees of motions become dominating, "inversions" may be regarded as repeated processes. In light beams we have the continuous transformation of the E-field to M-field to E-field during the propagation. Motion as such, even identifiable in elliptic rotation, implies a repeated "pole exchange", (d-degree 0/00 in our model) as inwards/outwards; so too in longitudinal waves, so in the gait of living individuals.

As to the expression for velocity, Distance/Time (D/T) and last step in our dimension chain, it's possible to regard it as a transformation - or translation - between complementary poles in itself. With the illustration from file Motions:

*
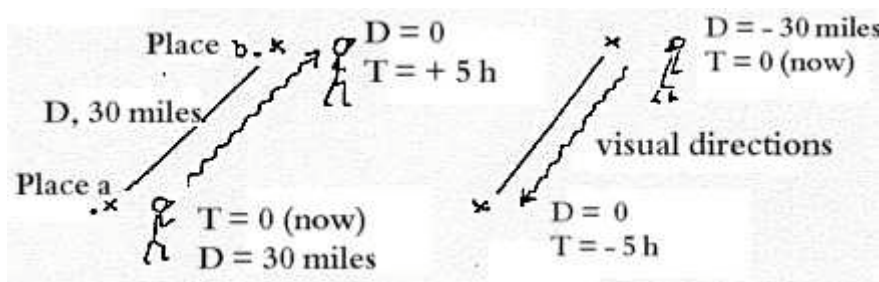
From 4th to 3rd dimension degree - problematic issues, I - II

In following files some problematic issues concerning the dimension degree step 4 → 3 are discussed.

Headlines - different aspects:

I. Introduction
II. Rotation
III. Geometrical aspects
IV. Multiplicity of Mass and its Distribution
V. Mass as property - once again
VI. Step 4 → 3 in terms of Forces

I. Introduction:

The start of Physics:
Physics starts at the border to metaphysics, or rather at the triple-point between metaphysics - mathematics/geometry - and human concepts expressed in words.

The start of Universe:
Universe is proposed to be a "*blown up singularity*" as in this model and there it starts. (But it doesn't seem to be any consensus about the size of this "singularity.)

   Inflationary or not, the Big Bang could perhaps be described in terms of "osmosis" (!), a scalar field of density, the derivation of which is vector fields.

Compared with the model here, sketched in Presentation, *scientists seem to look at the creation of Universe backwards*, from the end of the 5-dimensional chain: the first stage after Big Bang is described as a Universe of "radiation" only. Probably electromagnetic (EM) waves (?), referring to the observed nearly homogeneous background microwave radiation. This radiation should then in some way partly transform to electrons, protons and atoms.
   At the same time they imagine all forces united at start and gravitation as the first one being "precipitated" from the other ones. And, according to other books, the only way one have observed "matter" created by EM-radiation is when energy rich photons create pairs of electrons/positrons (e-/e+), in the neighborhood of heavier masses or atoms (as a condition).
   It's not easy to unite these different aspects in terms of established scientific data.

According to the 5-dimensional chain of concepts in the model here, reading it outwards towards lower dimension degrees:

$$5 \to 4 \to 3 \to 2 \to 1 \to 0/00,$$

forces or vector fields as Acceleration/Gravitation, F_A / F_G come first, in next step the EM-force, and the polarization Mass — Space before Matter with polarization of Charge, and waves in steps $\to 2 \to 1 \to 0/00$.
   However, reading the chain as from a perpendicular viewpoint, with debranched degrees in first steps meeting the other way around, illustrated in the figure below, the different proposals of the scientists seem more easily understandable.

$$5 \rightarrow 4 \rightarrow 3 \rightarrow \leftarrow 2 \leftarrow 1 \leftarrow 0/00$$
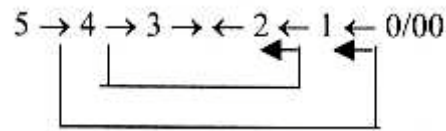
What they imagine as purely radiation becomes in this interpretation only the debranched degrees from first steps, but should be complemented with the structures from vector fields in steps $4 \rightarrow 3 \rightarrow (2)$.

It's very much that physicists don't know:
They don't know what Gravitation is and how it can act over distances, just imagine a lot of small quanta as gravitons gathering to a discontinuous "field" or the inverse, a field quantified in those imagined quanta.

   Some believe they can skip gravitation and replace it with the curvature of space - but only half of the curved way of light around the sun could be explained by the curved space, the other half through "gravitation".

   And they don't seem to know why big masses are curving the space around them.

   They don't know what Mass is, what is giving matter the property of Mass, but particle-hunting physicists now are looking for the "Higgs' particle" that should give this mass property.

   They didn't know, at least forty years ago, what Charge is and probably not yet.

   They don't know what "Spin" is, an invented property, it's neither this, nor that - but still useful.

   Not to mention quantum mechanics, which they readily admit they don't understand but still have rules and some words and mathematics to manage.

Yet, these concepts, forces, mass, charge and spin are the main properties which they use in the "standard model" to describe the realities, besides time and distances.

Such questions, what something "is", are by definition, hard to answer: The answers have to be given in any of the three areas meeting at the triple-point. Words and mathematics for the physicists' part. And there are a lot of concepts and different mathematics to travel around in. Concepts have to be defined through other concepts and these through others again.

   A force, for instance, was earlier defined through its effect, as something that changes a motion, its direction or speed. Now, in the "standard model", forces are described similar to human talk: two persons as "particles" throwing words as small field quanta, photons or other things, on each other. Something like bacteria, joining to exchange parts of their genetic code, just to describe it on the superposed level of living societies.

   One conclusion: If we want an understandable description in words, it seems as we have rather much of a free choice when it comes to which concepts to use.

The concept "Dimension":
A special problem is the different ways to define the concept "Dimension".

   In this model we have defined an outward or inward directed vector field as 4-dimensional. In which sense isn't it 3-dimensional - or representing an infinity of dimensions as extensions in an infinity of directions?

- Physicists want one dimension for each independent variable. Independent? Shall we believe that? According to the model here nothing is really independent, at bottom. This "independence" seems only to refer to elementary geometry and the usual coordinate system and relations where the scalar product of vectors are zero.

- Mathematicians as Hilbert creates an infinity-dimensional room for possible "states"...

- In ordinary speech of today there is often talk about this and that as another dimension, usually referring to another aspect, characterized through some kind of contrast or opposition.

- In elementary geometry we have the usual coordinate system of 3 axes and they are indeed also characterized by opposite directions from the origin, with signs plus and minus. One says that the 3 axes are needed to completely define the position of a point in space. However, this view disregards identification of the origin, where the axes cross each other, and the "directions", the "signs" (+/-).

   One definition concerns extension, actually built on the basic concept Distance. A point has no extension, represents dimension 0. The extensions are created first with distances and space.

To this comes the little problem with a curved line or surface: a curved line is 1-dimensional in itself but needs 2 dimensions, a curved surface 3 dimensions for its existence. What about a curved space - ? - or a "curved" mass? * And in the String theory a linear string needs 10 more dimensions plus Time for its vibrations to express such things as mass and charge and what else: still another definition of "Dimension" as it seems.
   *A point has in these days been defined as something with an infinite   radius of curvature - a really self-absorbed definition!

So, in which sense do we use the fundamental concept Dimension in this model, when describing vector fields as 4-dimensional in relation to Masses and Vacant Space as 3-dimensional? The infinity of directions outwards from a point or inwards towards the point is obviously not seen as different dimensions, just as a property in this dimension degree (d-degree).
   When talking about 4 dimensions we use the kind of definition which concerns how many data that are needed to identify a certain unit (3 for position in space, + 1 for directions outwards/inwards. When talking about Mass and Space as 3-dimensional in relation to vector fields, we still keep to the polarization concept of two complementary "structures" but suddenly also enter into the definition of dimensions as extensions, viewing Masses and Space very elementary, without complex curvatures, only in their external form.
   Do we use the same definition of dimensions in these descriptions? What happens - in the "degradation" of our viewpoint - or physically in the formation of enclosed volumes as masses - when stepping from 4 to 3 dimensions?
   How does an infinity of directions ($\mathbf{v}$div / $\mathbf{v}$con) transform to an ordinary 3-dimensional form in the step 4 →3 according to the model here? In which sense could Mass be interpreted as 3-dimensional in relation to vector fields as 4-dimensional?

There are many questions connected with this one:
- Why do all masses of universe rotate?
- Why this manifolds of masses and unity of Space in cosmos?
- And again: What is Mass, how should Mass be interpreted as created through this step 4 →3 →(2)?

See also a new suggestion about "GA-waves".

II. Rotation

Why do all celestial masses rotate, cosmic clouds and elementary particles, even haploid eggs in the oviduct? It's an obvious reality for celestial bodies in macrocosm and in microcosm, but what is the best way to explain it?

   In which sense do principally anti-parallel vectors (outwards-inwards) towards a center, in step 4→3, change to perpendicular ones, an angular step proposed in the model here? And what makes expansion-contraction transform to rotational phenomena? It's difficult to find any convincing explanation in the used literature behind this discussion. The question is connected too with the problematic turbulence.

1. Rotation as a 2-dimensional motion:

1a) In terms of the elementary 5-dimensional conceptual structure of our model:
   We may ask: *What is lost in the dimension step 4→3*? D-degree 4 is defined as vector fields, and a vector, according to the established definition, is a physical quantity that besides numerical values must be given a direction. So it has to be the character of Direction that is lost in the structure in this step - and translated to motion. A circular form has no direction in the sense of inwards - outwards.

1b) *In d-degree 3 two degrees should be viewed as debranched and transformed to external motions*. A 2-dimensional motion is rotation. (See files Presentation and Motion.)* Hence, rotation is viewed as one expression for the polarization of Direction in "poles 4a — 4b
   There is also the general view on a dimension chain as steps towards a more and more specified (crystallized) direction towards "one-way" character. (From a chapter on "chance", not yet on this site.)
   The one-way direction in rotation could be a Testimony of the rightness in the view of masses as one "pole" or partial structure in relation to a complementary one, the Vacant Space. (It may demand an excuse pointing out the natural fact that Space "rotate" in the complementary direction around celestial bodies.)

* **Now it seems wrong to state that a celestial body has only motions in 2 dimensions. A planet like the Earth has its translation too, its pathway motion (and a slow rotation of its rotational axis!). How then justify the proposal? We could perhaps presume that it is the orbital as a 2-dimensional plane of each planet that moves around the sun, not the 3-dimensional planet (but not the same as the very slow rotation of the orbit of Mercury for instance, which Einstein explained). We could alternatively see the linear motion in "geodesists" as expression for the motion on an underlying 4-dimensional level, not belonging to a step in the same dimension chain?**

2. Starting and end points of vectors as "stretched out":

The starting points of vectors inwards - - and target points of vectors outwards - have positions "stretched out", with a formulation from quantum mechanics, not defined - or all possible...
   The infinity of starting points of Direction inwards as a virtual, circular structure may be interpreted as transformed to Rotation with a factor of Time, that's Motion.
   Compare the indeterminable principle: If a particle has a certain moment, implying direction, (as inwards from the 00-pole towards a center in our model), this implies that it has all possible positions. If it has a certain position (as the 0-pole in our model), it has all possible directions. And here the 00-pole is just defined as "anticenter". Compare that the 00-pole also represents multiplicity in our model.

In a surface, the 3rd d-degree is indefinable, and in 3rd d-degree the 4th d-degree should be likewise indefinable. The higher d-degrees have the character of "superpositions" (sooner "sub"-positions).

Rotation, illustrating the "meeting points" between targets of outward direction and starting points of inward directions, may be regarded as expression for the binding force between mass and empty space (E= +mc2/E=-mc2) - ultimately an expression for d-degree 5 as the binding force between center and anticenter. This in accordance with our description of d-degree 5 as step by step translated into motion through the dimension chain.

Hence, rotation in d-degree 3 should be interpreted as resulting from the combination of a radial and circular geometry.

As to a higher d-degree as indefinable in rotation, a similar description is given for quantum numbers of electron shells in the atom: two of the quantum numbers (s l, x) are fixed, defined, but the 3rd not: it is illustrated as a vector with fix starting point but the arrow of which rotates around the y-axis.

(The slow rotation of the "y-axis" of the Earth seems to illustrate the same?)

3. How do physicists and astronomers explain Rotation?

The fact is that they don't seem to have any common explanation. One vague suggestion is that rotation should result from some irregularities in the surrounding gravitational field. If so, we could compare with the general assumption in our model that the 00-pole as anticenter, ~ surroundings, represent the polarizing force. Here in the step 4 →3.

Other sources refer more accurately to the law of energy preservation: When a celestial cloud contracts through gravitation, the potential energy of the outer areas in the cloud decreases and the energy has to transform into something else: rotation. To a certain degree it may transform to temperature radiation outwards until the density becomes too high. There is a change in the "quality" of energy (a formulation attributed to Sarfatti).

If this view is an explanation or just a description may be discussed. In any case it is in accordance with the general proposal in our model that a) there is a geometrical transformation from outwards-inwards to a radial - circular one, b) it is in a certain sense the inward direction from the anticenter that transforms into a circular geometry.

One author talks about "random motions which probably show a little surplus in one direction" and with decreasing radius develop to rotation in that direction. A rotation of a star 17 times per second (!) is attributed to its collapse to about 20 km radius, and to the law about preservation of angular momentum.

Another formulation: the temperature ought to increase when a celestial cloud is compressed, but the clouds of gas have an effective way to get rid of the created warmth: the energy is stored as rotation of the hydrogen atom. (Hence, not only rotation of the big clouds, even the one of individual atoms?!)

Compare the perpendicular relation between energy forms of Frequency and Amplitude in electron shells (file **EM-waves**): absorbed energy expressed in amplitude of electrons, outward transmitted energy as "radial" radiation, expressed in frequency.

4. Turbulence:

A corresponding transition from linear to 2-dimensional, rotational motion appears in the emergence of turbulence in gases and liquids. Why has turbulence been such a mystery for the scientists? (One of Heisenberg's questions to God: Why turbulence?)

How does a more or less rectilinear current suddenly change to whirls and big whirls breed smaller whirls etc.?

We could try the assumption that more substance (as one form of energy) is poured into a water current for instance than the outlet permits, in accordance with the description of celestial clouds above, which should imply that the surplus of energy had to be translated into rotation.

According to chaos research however, this cannot explain why currents, like the Golf stream as an example, here and there begin to wind and generate whirls or debranched circular currents. Or the behavior of smoke from a cigarette. We could probably add: the Rossby waves from the jet stream of wind around the arctic pole, from which more or less circular high-pressure and low-pressure cells are debranched.

Could we assume that everything in the way of a linear current, invisible perhaps, that can get the role of a center, curves the linear motion as if activating one pole of d-degree 4 and step 4 →3? Perhaps a reality in some water streams but not a satisfying assumption according to other examples.

Looking at our elementary dimension chain we have:

D-degree of Structure: 5 → 4 → 3 → 2 → 1→ 0/00
D-degree of Motion: 0/00   1   2   3   4   5

Chemically, solid, liquid and gas phases have in another part of this booklet series been characterized as 3-, 2- and 1-dimensional phases respectively on that higher, chemical level. (Water for instance has molecules with a plane form.)

If our simple scheme above is possible to apply to that level, we should find a 3-dimensional motion in liquids and a 4-dimensional motion in gases: perhaps in the form of spiraling (= translation + rotation) - with addition of a motion inwards - outwards as expression for the 4th d-degree. (Inwards?!. Do we eventually find such inward directed but perhaps disregarded motions in gases?)

There are interesting experiments in the literature showing how 3-dimensional motions are appearing in liquids (mentioned in a book about chaos):

A spot in a liquid was observed to twirl east - west, up - down, inward - outward. And Theodore Schwenk who studied currents in a watercourse found secondary streams moving as in spirals, as one surface rolling around another. Another example: studying liquid helium, there was observed first the formation of two rotating cylinders of the liquid, then, a bit later, also waves along these cylinders. Hence, a 3-dimensional motion.

Scientists also use the term "phase transitions" when talking about such examples of turbulence, which in our model should represent dimension steps.

The motion of a stream may represent a 4-dimensional "vector field" as it appears on that higher level of Matter. "Direction" as structure. A liquid as a watercourse - and a gas - has of course in its entirety also a mass and a surface to the surrounding, possibly developing to internal 2-dimensional "layers", and extensions as principally 1-dimensional. (The step from linear motion to rotational (2<--1), corresponds in our dimension chain to the step from the property Direction to volume, Mass, step 4→3→)

Hence, a stepwise increasing complexity in the motional patterns could perhaps be reasonable from this point of view, as expressions for how these different properties of the stream manifest themselves?

Assuming such phase transitions, should we think of them as endogenous or not? What causes the transitions?

One answer, in terms of abstract, general postulates in our model, is that a unit whatever it is, here a stream, always has a surrounding, corresponding to the anticenter pole 00, representing the polarizing force. Compare the talk about "external disturbances".

More concrete, a liquid has its borders, a cloud its emptier surrounding. We could imagine that the difference at the border - as defining a border in itself - is enough to represent a

polarization. Difference in velocities at the borders, through friction perhaps, should be enough to create polarities.

The different properties in structure of Direction and Mass (4 →3) seem to manifest themselves stepwise, and this could depend on a change in velocity. Velocity has in our model tentatively been identified with the dimension steps as such, representing the debranched d-degree, fundamentally expressed in the last step 1 → 0/00.

About the splitting up of whirls to smaller and smaller ones:
In a rigid body or a big whirl all parts or particles in the whirl rotate with the same angle frequency, transverse the same angle (as an area, 2-dimensional) in the same time.

To get the same velocity, to pass the same distance (1-dimensional), the rigid body will have to crack, the big whirl split in all kinds of angle frequencies like frequencies in white noise. In this respect turbulence represents a qualitative, geometrical step from d-degree 2 →1 in motional structure repeated. (Cf. perhaps Lev D. Landau who has seen the turbulence as result of "competing frequencies", mentioned in a book about Chaos.)

It also implies a step from rotation concerning the radius to rotation concerning the circumference, poles 3b to 3a, (from radial to circular) as a repeated "pole exchange".

*

From 4 to 3 dimensions - problematic issues, III-IV

III. Geometries
Curved Space, the angle step 4 → 3 in terms of pure geometries:

1. A perpendicular geometry:

It is a fact that a perpendicular geometry appears in several physical relations:
  It's pointed out that the gravitational (centripetal) force acts strongest along the rotation axis, while the centrifugal force as its opposite acts along the equatorial plane.
  Other examples: In old physics the orbitals of planets are illustrated as the combination of two vectors, one pointing inwards towards center, one the tangent to this. And we have the orthogonal relation between electric and magnetic components in an EM-wave, as between the amplitude and radial jumps in electron shells.

Most elementary: equality should reign around a first center. Equal distances form a circle, perpendicular to the radius. If divided, it seems natural to think it should be divided in equal parts. Halvings seems to be (or has been given ?) the principle for spin. Quarters for something else - as from a second polarization.
  Hence, starting with a center as first prerequisite, we could see the perpendicular geometry, assumed in d-degree 3, as an inherent, inevitable development from a principally anti-parallel one?

Another aspect: According to our model we have one d-degree of motion in a 4-dimensional vector field, a 1-dimensional, i.e. linear motion, ("to and from each other"), which means a longitudinal one, as variations in density, defining spherical layers in the geometry. The motion moment acts as a polarizing force. (Note that we have proposed Density to be the first "physical quantity" in step 5 → 4, when identifying the usual physical concepts in the dimension chain.) So from a 4-dimensional, anti-parallel structure plus a 1-dimensional motion we get a 3-dimensional geometry defined.

2. Non-Euclidean geometry:

The views above seem much too simpleminded and bound to an Euclidean geometry to explain geometrical realities? What if we look at cosmos in terms of non- Euclidean geometries?
  Scientists say that big masses curve the space around them, but do they tell us why? Masses have positive radius of curvature, the space around big masses have negative curvature. But as far out as one have been able to measure the cosmic space in itself, (the angular sum of a triangle), it seems to have an Euclidean geometry.

Departing from our model we could rather presume that curvatures in the geometries precede the creation of masses or at least are an intrinsic part in that creation and in a polarization Mass - Vacant Space (or E= +/- mc^2).
  The surface of a globe has an elliptic geometry; the angular sum of a triangle is more than 180°. The area between three adjacent circles has a negative curvature; the angular sum of the triangle is less than 180°.

An hyperbolic geometry, a combination of positive and negative curvature, is of course the most consistent with the model here, characterized by polarizations. It's often compared to a horse saddle when it concerns surfaces. With this metaphor, there are simultaneously 2

polarizations in the geometry: a step to a perpendicular relation between coordinate axes and a curving of these in negative / positive directions.

Such opposite curvatures may in fact be identified as transformations of Direction inwards - outwards: the positive one defining an enclosed center, a transformed inward direction, in d-degree 3 a globe as volumes for masses. Whereas the negative one describes an excluded center, as a transformation of outward direction - defining an anticenter as Vacant Space in d-degree 3.

3. Constant positive or negative curvature:

A constant positive curvature, along both coordinate axes of a surface, gives the globular, elliptic form of volumes for masses in cosmos. The hyperbolic geometry rather describes the relation between two such globes with intermediate space: perhaps a reason to interpret what is called "gravitational" centers as responsible for both the attraction and separation between celestial bodies? A manifestation of d-degree 3 of the unpolarized kind of dimension degrees that we haven't been able to find in physical terms?

Where could we find negative curvature along both axes? Such a form has been compared with two counter-directed trumpets, what is called a "pseudo-sphere". (Introducing a distance between their border circles and positive curvature joining them, we should get a form similar to a spiral galaxy.) The double-trumpet could be described as if each arc of a quadrant in a circle was inverted.

One example of this geometry could be the magnetic field between 2 magnetic N-poles, forced to meet, repelling each other.

4. Why curvature?

The geometrical aspects depart from 1-dimensional lines. That's a view from lower d-degrees towards higher, inwards in our dimension chain.

A curved line implies an "*intrusion*" of d-degree 1 into a 2-dimensional world or a start of defining such a world, a beginning of an orbit plane (a step 2 <— 1). A curved surface implies an intrusion into a 3-dimensional world.

With the assumptions in our model of debranched degrees meeting "the other way around", Step 4 →3 corresponds to the step 2 <—1.

The "intrusions" inwards in the chain along the main axis could in very general words be regarded as transforming the geometry between the principally anti-parallel vectors in d-degree 4 into a 3-dimensional geometry with polarized volumes through curved surfaces.

It seems easier to interpret the curving as built-in motional structures from the end of a dimension chain, with the chain as double-directed, giving us an observable world with 3- and 2-dimensional forms.

5. Centers in the geometry as shrunk or increased:

Another aspect on the non-Euclidean geometries with positive and negative curvatures departs from the description that a surface which grows faster than proportional to the radius squared give a negative curvature, a surface growing slower than proportional to the squared radius gets the positive curvature.

Now, taking a piece of cloth and pursing it up in the middle (representing a shrinking center or origin), one gets a wavy surface outwards on the cloth as representing a form with negative curvature.

If adding a piece of cloth into a hole in the center, increasing it, the surface will curve in a

positive manner, more adjustable to the football principle.

Hence, the curvature is depending on the size of the center - or the unity with the role of a center pole (the 0-pole) in our model.

The negative curvature could derive from an underlying level, a smaller origin or 0-pole from which we have the outward Direction in d-degree 4. With growing complexity of the realities after Big Bang the center will grow more complex and may be thought of as increasing in size.

The positive curvature and gravitational formation of Direction inwards would follow purely out of this increased center! That is, if we start from an Euclidean geometry.

The relation between Vacant Space as divergent and Mass volumes as convergent would then simply be interpreted as a relation between center and anticenter, as suggested in our model - with the addition of a Time factor.

A main concept used in the background texts here is "center displacement". Neglecting the assumption of a gradual growth, a center displacement implies that the circumference (as a 00-pole) on one stage becomes the center for the next stage.

In a description of the elliptic geometry it's stated that
a) a line in Euclidean geometry may be represented by a point in elliptic geometry,
b) a plane in Euclidean geometry may be represented by a line in the elliptic one,
c) a solid angle between planes in Euclidean geometry may be represented by plane angle (as 2-dimensional) in elliptic geometry.

This points towards the interpretation of the elliptic curvatures as of a lower d-degree. The opposite should apply to a the complementary geometry with negative curvature, lines representing (or growing to) surfaces etc. - and points representing lines...

Such descriptions indicate that we should see the elliptic geometry and the geometry of negative curvature as of different d-degrees. (Or potentially pointing towards lower and higher d-degrees respectively?) Elementary, as there exist an infinity of surfaces in a volume, a higher d-degree represents unity in relation to a lower as a multitude. We have the unity of Vacant Space and the multitude of celestial bodies.

6. A Time factor again - and the curvature of sine waves:
With (another) Time (or "phase") displacement, we have the form of usual sine curves - as projected outwards from a vector rotation in a unity circle.

The curvature is positive to 180°, then becomes negative in relation to the first part of the curve, a relation between a and b around the inflection point. Curve b represents the concept of an "excluded center". It could be regarded as the curve a mirrored two times in two axes, both horizontally and vertically.
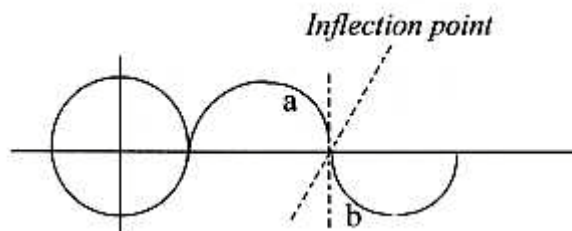
It's the form of surface waves, positive and negative curvature in a mutual relation, as a circle of rotation broken up and polarized in time: We have the opposites convex/concave (representing opposite signs), suggested as one description of the complementary poles of d-degree 2, but following one successively in time.

The inflection points in a 2-dimensional wave make up or define a 1-dimensional line. This is perhaps one answer to the question how on earth the polarization of a 2-dimensional surface

in "inside/outside", "convex/concave" may define an 1-dimensional line according to our model !?

Two notes:

a) Hyperbolic geometry in the atom?
In an atom mass volumes with positive curvature is concentrated in the center. Could we eventually find some expression for a negative curvature, if connected with empty space, at the electrons?
   Could an hyperbolic or negative curvature described as excluding a center, be connected with Pauli's "exclusion principle" between electron pairs - or something else in the electron shells? In our views on protons versus electrons we have seen them as "grandchildren" of the opposite vector fields in d-degree 4, children of Mass and Vacant Space respectively (see file **Forces**).
   Besides this question: In the tentative interpretation of quarks in nuclei as p and n, we have suggested a parallel to the gastrulation process in embryos, including both elliptic and negative curvature in the motional structure of growth.

b) Olber's paradox:
It has been stated that if the Universe eventually had a hyperbolic geometry, then we should be able to find more and more galaxies the further out in cosmos the telescopes reach. However, with the assumptions in our model this conclusion must be wrong?
   If at a certain stage a hyperbolic geometry is polarized in positive curvature of mass volumes and negative curvature of "Vacant Space", then it's only empty space that give the widening lines of sight, and proportionally fewer and fewer galaxies would be found further out. One possible explanation to Olber's paradox?

<div align="center">*</div>

IV. Multiplicity of Mass and its Distribution

The manifold of masses but apparently unity of "vacant space" should in one sense follow from pure geometries and relations between d-degrees as said above. But how explain the fragmentation of Mass or the multitude of centers for gravitational concentration?
   And how explain the distribution of masses from what is supposed to be a uniform development of geometries from a Big Bang center?
   It has been said that the observed, nearly homogeneous micro wave background radiation in cosmos - taken as supporting the Big Bang theory - has not been able to unite with the "unequal" distribution of masses. It's unclear in which sense it is regarded as unequal.

1. Gravitation as a polarizing force!
Gravitation, FG, as an inward directed force with its foundation in the 00-pole is also, according to first postulates or hypotheses in our model a polarizing, splitting force. How can this apparently wrong hypothesis be justified and maintained?

In fact, there is such a polarizing force acting in cosmos, according to the scientists' observations:
   Contraction through gravitation in cosmic clouds lead to a fragmentation, a splitting up of the clouds in smaller clouds and the birth of a great number of stars in groups or crowds.
   It's stated that a cloud under certain conditions (of total mass, density and temperature)

begins to contract, and then gets fragmented "in several steps" to smaller and smaller

"clumps".

Secondly, one has also observed a "spontaneous" polarization between hotter and colder regions in celestial clouds, which seems to contradict usual thermodynamic laws.

The contraction means too that the H2-molecules are split into H-atoms (probably explainable simply through increased temperature?).

Hence, we seem to have first a polarizing force, which could be attributed to the 00-pole of d-degree 4 in our model, then or apparently simultaneous a contracting force, as Direction inwards (pole 4a) in d-degree 3 in our model. A third appearance of the gravitational force in d-degree 3→ to 3b (one pole in d-degree 2) should give the birth of stars and rotation, probably also with a factor of polarization. (Rotation may be interpreted as a "haploid" motion, pointing to another half with opposite rotational direction.)

Should we talk about Gravitation in all three d-degrees or perhaps give the first polarizing force (00) another name?

2. The polarization principle not recognized as such?

The fragmentation of these celestial clouds is not explained in the sources used here. There is only talk about "small disturbances". The problem seems to be the same as with turbulence.

A general polarization principle - in several steps, of several kinds or properties and not called attention to as such, partly unknown or unexplained, could be the answer.

From the viewpoint of polarizing motions (the end of the 5-dimensional chain in our model) and the assumed 1-dimensional longitudinal waves attributed to vector fields in d-degree 4, they should create rings or shells of denser regions.

It's difficult to avoid the assumption that a secondary polarization through motion of a transversal kind is needed too in explaining the distribution of mass centers in cosmos; some kind of inherent waves in step 2 1 as results of d-degree step 4 →3 in the structure, along the circumferences (compare our hypothesis about side waves).

Such waves are never mentioned in the used sources. However, the sun for instance is said to be divided in sectors, with opposite directions or signs for the magnetic field - and cells of convection streams.

Examples, where a general polarization principle intuitively is applied: Pauli's "invention" of the "exclusion principle" between electron pairs in the atom, given the explanation of opposite "spins". The still chiefly theoretical "up" and "down" quarks.

3. Why this "unequal", " not homogeneous" distribution of mass in Macrocosm?

Scientists mean that the nearly homogeneous background microwave radiation found in cosmos should imply an equally even distribution of Mass in cosmos. This contradicts the irregular or not "homogeneous" distribution of Mass, as they see it. There is no good explanation found.

In one source used here it's proposed that a rapid increase in size from Big Bang led to the result that different parts of Space "lost contact with each other" which should imply that "local fluctuations" in density could be permanent. Such a description doesn't feels satisfactory, at least not with our model here in mind. "Local fluctuations" and "small disturbances" and such references sound without contact with any scientific principles?

To approach the problem, we could test to look at dimension chains as a genetic code: We could ask:

How many (crossing-out) principles of differentiation are needed to explain the individualization of mass in cosmos? (Eventually starting with 4 forces, F_A, F_G, F_E, F_M, as there are 4 bases A, G, C and U in the genetic code!)

For instance: a) gradients of densities, b) gradients of forces' strengths, c) gradients of velocities, d) gradients of radii of curvature, and with Time: e) generations of masses. (Cf. Hoyle's "C-fields".) Perhaps it is enough, or do we have to add chance, fluctuations within the

borders of uncertainty in microcosm?

   There is of course no answer here. We could just make the supplementary note that gradients may have the character of discontinuous steps, changing the "quality* of energy" when a certain amount of energy or a certain interval is reached?
* (Said to be the view of Sarfatti 1975.)

4. What creates the many centers? Or how are they identified as such?
Before differentiating processes:

   In our simple geometrical terms the starting point of a vector field inwards has a spread out position with the word from quantum mechanics. The same holds for the first indefinable target of the outward directed vector field.

   Somewhere in the literature it's stated that convergent vector fields (vconv) give an undefined center, as if not pointing to a common, singular one. Why? No explanation in that text. Because the divergent vector field from the primary center already has given birth to a multiplicity of secondary centers, a process preceding the convergent vector fields? Because convergent vectors are pointing backwards in Time - ? - referring to a center already on its way? The convergent field meeting the divergent one "halfway"?

   Such a view could be connected with the idea of an eventual inflationary stage of development after Big Bang.

There exists something of a similar relation between "vectors outwards and inwards in the nervous system: In the inward directed **parasympathetic nervous system** the nerves depart from the peripheral ends of the vertebral column, from head and tail vertebras (at least in human beings), while nerves from the sympathetic system, outward directed towards brain and muscles, start from the middle region of the spine.

   Ganglions as centers (?) for the sympathetic system are situated near the spine, with many connections with one another, while the ganglions for the parasympathetic system are situated far away, distributed and localized as separate to the neighborhood of the individualized intestines. These are organs developed from within, roughly said from the vegetative pole of the first embryo.

Another question: Should we think of vectors outwards as branched? Compare "*bifurcations*" at certain stages in chaos research.

It could perhaps be appropriate to apply aspects from quantum mechanics on the question about the multitude of centers. Identifying a higher d-degree is undefined in the lower d-degree, the higher one representing a "superposition", this could imply that the outcome when it "collapses" (here through a d-degree step) may show up as yes or no (~ mass or vacant space) - and anywhere? Compare what is said about quanta of forces, that they may have any mass whatsoever, that's undefined. It sounds like one possible answer to the not homogeneous distribution too.

Where do we find the first ovum in a developed human body? An idea about divisions (equal to polarizations?) becomes implicit in such a question, if a parallel to Universe. And copying of a code, which as a suggestion here should be represented by dimension chains as the general pattern within the frame of surrounding conditions and actual Time.

After all, the cosmic multitude of centers resembles turbulence, smaller whirls or bubbles born from bigger ones etc. The long (or protracted) distances between celestial mass concentrations seem perhaps to contradict this similarity but may be a chimera. Expansion of Vacant Space creates the distances, with more or less of negative curvature.

   Very simpleminded: Why are gathered masses so small in relation to empty Space between them? One equally simpleminded answer: The "lengths" of vectors pointing outwards are

principally unlimited, while the "lengths" of inward directed vectors gets principally limited by definition at their meeting points (ultimately the black holes?):

$$00 \rightarrow 0 \leftarrow 00 \qquad 00 \ldots \leftarrow\!\!\!-\!\!\!-\!\!\!- 0 \!-\!\!\!-\!\!\!-\!\!\!\rightarrow \ldots 00$$

5. Bubbles:

Looking at macrocosm as 3-dimensional, as from a 3-dimensional point of view, we may perceive the accumulations or "bubbles" of masses, stars and galaxies, as elevations from a more high-dimensional world. As unavoidable irregularities in a "degraded" space.

   Aggregation of masses becomes " intrusions" from a 5-4-dimensional world into this lower degree. (Is that why mountains are regarded as homes for Gods?)

We have mentioned such "*intrusions*" from the other direction, lower d-degrees as 1-dimensional lines when curved making "intrusions" in d-degree 2, curved surfaces in d-degree 3. Extra-(or inter-)polation gives "curved" 3-dimensional volumes implying intrusions in d-degree 4: What should such "new" curvature of volumes involve? In which form should it appear? Perhaps just that which Einstein said, that big masses curve the space around them! I.e. another aspect on Space: not only a simple, all-penetrating coordinate system x, y, z, applicable in the same way in masses and empty space, but with another, separate more high-dimensional manifestation in these "bubbles" of masses. (Another possibility is to associate it with negative curvature but inwards, the principle of life!)

   Viewing the development in the other direction: Do the "intrusions" of higher d-degrees into lower ones, of a pole of d-degree 5 and d-degree 4 into d-degree 3, imply something else than intrusions seen in the opposite direction?

   It seems so in one sense: We get the high-dimensional world inside, within the aggregated masses, not as external as with the opposite view.

If a 4-dimensional and partially 5-dimensional reality shall show up and find room in a 3-dimensional world, there unavoidably will be "bubbles" in the x-y-z-space! Bubbles as the result and a solution of he problem.

   Vector fields outwards/inwards have to curl, volumes transform to surfaces, as surfaces into lines, a way of transformations from a hyperbolic geometry with negative curvatures* towards an elliptic one in its adjustment to an Euclidean surrounding. D-degree 0 → 4 →3 →(2)

   (Mass is a very effective way to stow energy. A shirt for volumes of chests gets flat as a surface when packed up. Diagonals reduced to points!)

*Is there a possibility that the meeting of 2 negatively curved surfaces
(or volumes?) - which would presuppose several centers or "0-poles" -
may imply formations of enclosed volumes and the start of the "gravitational force" and the elliptic geometry for masses?

Einstein is said to have imagined the property Mass as one dimension added to the 4-dimensional space-time. It sounds curious and doesn't agree with the views in the model here, but it could eventually be understood in the sense above. (Compare the suggested interpretation of formula $E = mc^2$ (file...): mass as 3-dimensional and the velocity c squared as representing two steps from d-degree 5 to 3.)

How is such a view compatible with the fundamental assumption in our model that higher d-degrees in masses, when interpreted as 3-dimensional, are transformed into external motions as rotation? Is it only a question about viewpoints? Is there perhaps no rotation as an "absolute" motion when taking the view "from inside" a mass, the rotation only a relative motion seen from outside in a 3-dimensionally interpreted cosmos? Perhaps only a question

about the level - or d-degree - of analysis? Or inner 4-dimensional vector fields as binding forces only partly transformed into rotation in d-degree 3?

The two views on "intrusions" could be illustrated by the perpendicular aspect on our dimension chain - and connected with the development of higher levels versus the process of reproduction, two directions which can be regarded as orthogonal in a dimension chain:

Towards new levels
↑
$5 \rightarrow 4 \rightarrow 3 \rightarrow ↑ \leftarrow 2 \leftarrow 1 \leftarrow 0/00$ **Motions built-in as structural elements**

When debranched degrees in first steps of a dimension chain meet from the end of the chain (0/00) inwards in step 3--2, a vertical axes through this step can illustrate a development direction towards higher levels as bubbles of celestial bodies - or atoms.

The one way direction of the chain,

$$5 \rightarrow 4 \rightarrow 3 \rightarrow 2 \rightarrow 1 \rightarrow 0/00\ (\sim 5)$$

can illustrate a reproduction way on the ground level. What is left of these d-degrees $2 \rightarrow 1 \rightarrow 0/00$ may be identified with the external environment in which the bodies move and from which they get their nourishment (as H-atoms or He for the galaxies).

Figure illustrating the thought about Level Development:
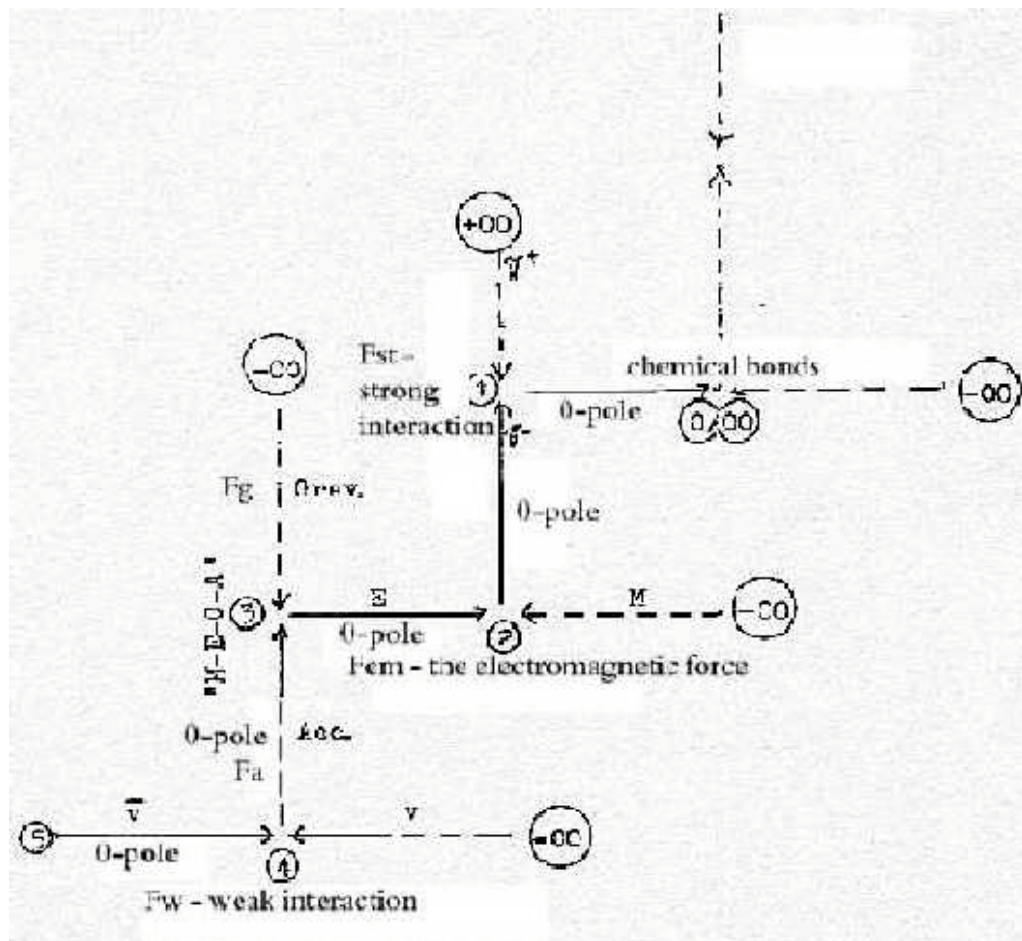
At first these views may seem incompatible with our descriptions of Mass and Space as poles of d-degree 3, but the a- and b-poles of a d-degree in our model inherit the characteristics of 00- and 0-poles.

We may also look at a dimension chain as "haploid" between 0 and 00-poles: (not 5---0/00) and assume that only the 0-pole develops towards intrinsic complexity and "bubbles" in the middle step 3-2, defining enclosed centers, while the indefinite 00-pole as anticenter only is defined through this process, only defined as the environment on each stage: the designing of mass bubbles given from "outside", ensuing from lower d-degrees through the condition: a 3-2-dimensional Space.

With such views it seems possible to unite the aspect of more high-dimensional bubbles of Mass in space with the suggested elementary definitions of Mass and Vacant Space as complementary "poles" of d-degree 3.

6. About Mass as an effective way to store energy:
Compare with transformations between *number-base systems*.

Suppose d-degrees are connected with such different systems. A number in base-10, if first divided in parts, most often give a smaller sum when transformed to base-8, than if transformed as a whole. Yet, a development from higher number-base systems toward lower ones implies growing numbers, mirroring the growth of cosmos.

In the opposite direction, a cosmos of binary digits may be packed up with higher number-base systems until we reach number 1 (as billions of cells in one head) and beyond that.

*

From 4th to 3rd dimension degree - problematic issues, V-VI

V. Mass as property - once again ?

How is the property of Mass deduced from pure dimensions, geometries and motions, according to our very elementary model through steps $4 \rightarrow 3 \rightarrow$ pole 3a (or 3b) ?

1. We have the views from earlier files that

- mass is a degree of complexity in structure,
- represents enclosed centers, in opposition to the excluded   center,
- is a property that (to a great extent - ?- or totally) lies in   binding energy,
- implies a step in the "substantiation" of lower d-degrees   towards higher levels,
- is closely related to Gravitation, regarded as a force, a vector   field,
- represents the dense "pole" of the physical quantity Density   when polarized,
  and inward Direction, referring to our first identification of   physical quantities.

2. Mass from radiation or vector fields?

According to suggestions in our elementary model, mass should be a property not defined as such before d-degree 3 is polarized and mass constitutes one "pole" or partial structure of d-degree 2 in relation to Vacant Space, d-degree 2 suggested as representing the property Charge.

          3b ---------2 ------------ 3a:

Hence, we should expect some close relation to the concept of Charge already in the concept of Mass. And in terms of fields also to the electromagnetic field (EM).
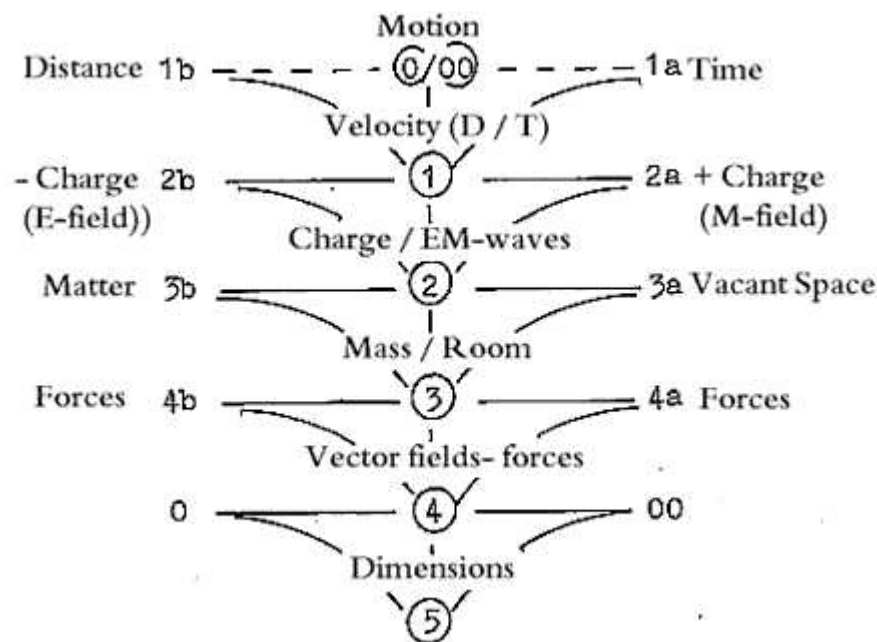
From the other point of view, from the 0/00-end of the dimension chain, Mass could include 2 (or 2,5) d-degrees of motion built-in, (of built-in Time if we want to express it that way), or of "velocity" as a concept for d-degree steps.

$$5 \to 4 \to 3 \to \leftarrow 2 \leftarrow 1 \leftarrow 0/00$$
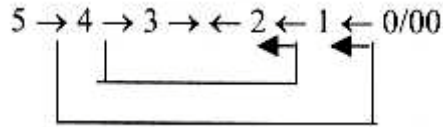
Physicists want to think of the first Universe after Big Bang as "radiation - obviously of EM-type, this then in some way transformed to protons and electrons with mass.
   According to our model, this should be only half the history: Some kind of 3-dimensional structure out of vector fields should be "meeting" in step 3-2 and included in the creation of matter with protons representing most of the mass.

3. A Higgs' branch and a Coulomb branch:

In connection with the search for "Higgs particle" in later years which should carry the Mass property, one meets the words about "a Higgs' branch" and "a Coulomb branch", as if the properties Mass and Charge was about a ramification. In our model this should imply the perpendicular reading of the dimension chain - as polarizations 5 → 4+1, 5→ 3+2:

$$5 \to 4 \to 3 \to \leftarrow 2 \leftarrow 1 \leftarrow 0/00$$
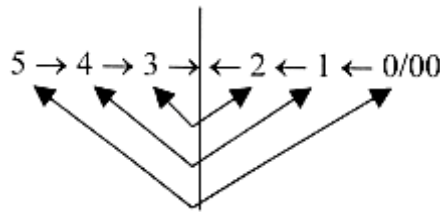
(A little more about Higgs' particle below.)

4. From bosons as "superpositions" to fermions with Mass:

The derivation of Mass from fields is in accordance with most physicists' theories: mass as tied up vector fields, locked kinetic energy or the like.
   In our model Mass is assumed as a property stepwise defined through 2-3 polarizations, i. e. through d-degree steps 5→4→3→(3a — 3b).

Bosons, the quanta of vector fields, usually described as massless as the photon, can have any mass whatsoever according to another formulation. We remember the interpretation of "superpositions" in quantum mechanics. In our model Mass is not yet defined in d-degree 4, first in d-degree step 3-2, as a certain quality of the energy, a certain structure in our view here. It's possible then to see the bosons as superpositions, representing higher d-degrees, the level where the outcome may be "mass - no mass" in lower degree.
   In our first postulates we have assumed the definition that higher d-degrees represent the binding force in relation to next lower degree. This seems illustrated in the relation bosons -- mass particles (fermions).
   The assumption is that bosons in some way develop into fermions with defined masses through polarization, giving increased complexity - revealed in the spin.

In spite of these general views, the vector boson W+/- of the "electroweak force" is attributed a defined mass. Here we have the property of Charge involved too, in our

model assumed as not defined until d-degree 2 or step 2→1. We have interpreted the electromagnetic force (EM), related to Charge, as a force in step 3-2 in relation to other forces in a the dimension chain of forces and obviously it's already involved in W+/-.

Hence, the fact that the Mass property - complementary to Vacant space - also is defined, should be natural. (Also the 3rd vector boson Z° is attributed a mass.)

5. Does Mass include a component from the complementary pole 4b?

Several suggestions in other **files** imply in our model that Mass as a property not only should be regarded as some transformation of "pole 4a", the inward directed vector fields, but also include a factor from the complementary vector field of outward Acceleration. So the suggested figure on **MEGA-fields**, the aspect on protons as "grandchildren" of the Gravitation force, so the suggested interpretation of **quarks**. To this comes the general view on Mass as a question about growing complexity.

How in that case identify it?
A general aspect in our model is to see development as a stepwise building-in of the surrounding as "00-pole" into centers defined as 0-poles. The simplest and most obvious suggestion is naturally that the outward directed (divergent) vector field in d-degree 4 becomes part of the structure, locked into the web of Mass by the inward directed one.

Gravitation is in certain contexts attributed a negative energy, and the real, positive energy in Mass could then in some sense be attributed this built-in divergent field, on the higher level representing a positive energy of expanding Vacant Space. If so, not only matter but also the property of Mass should break down in the centers of black wholes, if Gravitation becomes the totally dominating force.

Another application, with a viewpoint from the other end of the dimension chain, could be the aspect on Mass as braking of motion, negative acceleration, one form of built-in energy (in relation to Charge as built-in velocity) ? Compare Time as built into Space in a "4-dimensional Space".

6. About Complex numbers:

Concerning the charged W+/- and building in of the complementary poles in paragraphs above: The charge of the vector boson W+/- is said to depend on complex numbers which make the difference between plus and minus.

Suppose we have a coordinate system and write a square in the 3rd quadrant, with sides along the negative axes of x and y: both x- and y-sides = -1. This surface exists totally in the negative domain that we could read as inwards. The surface is said to be positive according to the mathematical rules used hitherto, which seem to have a limited validity; minus times minus = plus. (Why so?) To take the square root out of this negative, 2-dimensional surface to get its side, is said to be impossible (imaginary), therefore the "complex numbers". Hence, these numbers seem related to the 2nd d-degree (presumed as representing Charge) taken in the wrong direction, outwards.

We have inversions around the unit number 1, inwards towards zero, 0.

We have negative numbers on the other side of zero 0, as linear inward directions (towards a built-in negative infinity).

The complex numbers could be seen as forming a 3rd realm of the inner world?

7. M-fields and Mass:

The Magnetic force, not very appreciated as such, in its own right, depends, it's said,

totally on the rotation of electrons.

In the file about Mass and Matter was pointed to the relation found in some research between the proton being proportional to the M-field squared (and the electron proportional to the E-field squared.). And the main mass of the atom is concentrated to the protons (and neutrons). This seems to indicate a connection of Gravitation and Mass with M-fields.

If M-fields are interpretable as results of rotation of electrons, then one could guess that Mass could be dependent on some "pre-rotation" structure, i. e. a circular one, as in our first geometrical suggestions. Rotation as motion attributed to d-degree 3, a transformation of still one d-degree through step 4→3.

8. Higgs' particle:

This assumed particle should be responsible for the property Mass and it should be the "carrier" or quanta of a new field.

Expressed in those terms, perhaps only misleading (a single field representing Mass?), it sounds incompatible with the model here and the view on Mass as a result of increased complexity and relations between fields.

It's said about this field that its angle towards other (vector boson) fields is another and that the strength of the force doesn't reach zero. We may compare with assumed angle steps in our model and the roughly suggested geometry: radial versus circular, in d-degree 3. A circular field doesn't reach zero, the 0-pole. It could be expressed as a "center displacement", one of the general views on development in our model. (Mass as two steps of "strangeness"?)

Center displacements:
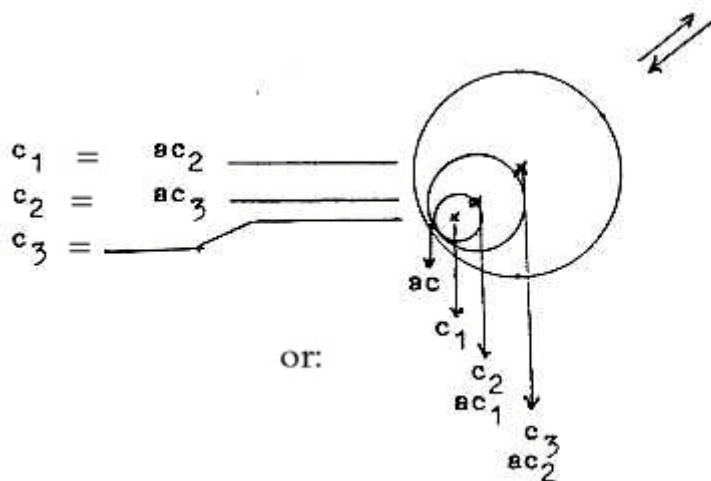
(A logical consequence of this view in our model should be that gravitational centers are more fundamental - or precede - mass centers.)

Then there is *the presumption that Higgs' particle represents a new field*. If so, this obviously contradicts views in our (certainly much more elementary!) model in which the inwards directed vector field of pole 4a (Gravitation) transforms through an angle step to a circular one in d-degree 3.

It's easy to say that we, in order to get a 3-dimensional "web" for Mass, need something representing three coordinate axes*, not only two, but the 4th d-degree in our model is all-directed. In any case, the different fields or forces of the standard model should be derivable or viewed as transformable into one another for a satisfactory model

to arise.

A perhaps related question: Should we imagine a phase displacement involved in the relation between G-and A-fields towards Mass, comparable with the phase displacement between E and M in electromagnetic waves?

* A simple aspect on growing complexity - as transubstantiation of a warp to a web and this further to a 3-dimensional one - is the operation of multiplication, multiplication of three variables as along 3 crossing coordinate axes: x times y times z. Cf. 3 polarization steps from $5 \rightarrow 4 \rightarrow 3 \rightarrow (3a — 3b)$.

3a — 3b as Mass — Vacant Space, "outer poles" (or partial structures) of d-degree 2.

Multiplication as an operator? The quarks in a proton are attributed masses around 5-10 MeV. 10 x 10 x 10 = 1000, roughly the magnitude of the proton mass or half of it.

These annotations about Higg's field were written some years ago, Now, February 2014, the theory is regarded as proved, the "Higg's boson found.
A **new file about this theory is added here.**

9. Substantiation through "Colliding Singularities" - and Interference:

Such views on the question about the Mass property are aspects from the other end of the dimension chain in terms of our model, from lower d-degrees toward higher ones.

Or in the perpendicular view on the dimension chain the polarization $5 \rightarrow 4 + 1$.

In the Dual field theory is suggested that Mass could be created through "colliding singularities". Oddly enough it sounds like a suggestion in the booklets behind this site, not presented here, that substantiation towards higher levels and matter could occur through the meeting between "haploid" dimension chains from the 0-pole (outward directions).

(Compare the psychological development of the 4-dimensional"I" of a child to a saturated Self and a 3-dimensional "personality" through meeting "confirmation" from others.)

The theory seems also to include efforts "blowing up" such "singularities", creating some shell geometries (representing Charge or what?): Compare cell balls developing to blastulas in embryology!

Are such ideas possible to unite with the theories about angled vector fields ?

Interference between waves could be described as one kind of substantiation through colliding of similar entities. We have assumed linear, longitudinal waves in d-degree 4 (file Motions). They represent a polarization of the property Density (assumed as first physical concept in d-degree step $5 \rightarrow 4$) into maxima and minima. In d-degree step $2 \leftarrow 1$ inwards, L-waves could take the curved form similar to sea waves. (Step $2 \leftarrow 1$ inwards is connected with the step $4 \rightarrow 3$ outwards according to the model.)

When such L-waves, forming an angle, interfere with amplified maxima, what happens? We could perhaps associate to the braking of what is called Monster waves in the see, said to have been explained by some development of Schrödinger's wave functions?

What should in a $4 \rightarrow 3$-dimensional form correspond to a braking Monster wave, stealing energy from its neighbors? The sun and its planets?

VI. Step 4 → 3 in terms of forces

1. Gravitation as a unique force?

It's said that Gravitation is a unique force, not possible to simulate or connect with the other "forces". One suggestion here is that the problem partly depends on the fact that the complementary "FA-force" - identified here with the universal constant A, has been neglected as a force. Yet it has been described as "*some form of inner pressure*" in opposition to Gravitation as "*an outer pressure*".

Another reason for regarding Gravitation as unique could be the mix in definition of "forces" which seems to exist from the viewpoints in our model:
   Gravitation (and the complementary FA-force) may represent forces in the sense of built-in higher d-degree, a binding force, while the other forces the physicists identify concerns the outer connection between the complementary partial structures of the lower d-degree, their "interaction", with quanta as "carriers".
   Hence, the problems or unique character of Gravitation may be about definitions and differentiation between concepts as Fields or Forces and Interaction (carriers).
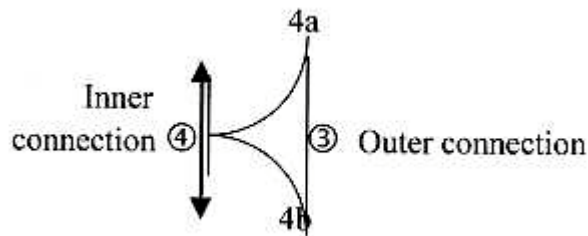
2."*ga*"-quanta of a double-directed field?

If the "FA-force" is recognized as such, the old differentiation between "purely aggregating forces", FG and strong interaction, and polarized forces (the electromagnetic one and weak interaction, may be misleading. In terms of "carriers" it may be wrong to look for "a graviton", instead a "ga"-quanta of connected fields - perhaps closely related to the "Higgs particle"? - in the same way as the photon represents the carrier of an EM-field (the electromagnetic one)?
   Perhaps such "ga-quanta" makes up the interaction (or the binding force) between E- and M-components in the photons? If so, with a phase displacement (180°?) analogous to the displacement of 90° between E and M in EM-waves. 180° in L-waves, "density waves".

In terms of waves, could we perhaps find "ga-quanta" as halves of the photon? Remembering Hawking's description of the **spin** relation?
   A connected question: May we imagine that colliding photons could result in gravitons or "ga-quanta"? (One kind of a "dual field theory"!) The locked light in "black holes" responsible for the strong gravitation?

3. About negative and positive energy:

Gravitation is said to have negative energy in a certain sense: energy is required to counterbalance gravitation. A positive energy of "the universal constant A" (or FA) is revealed in expanding Universe. Compare the description of the universal constant A as a kind of inner pressure in opposition to gravitation as a kind of outer pressure.

Perhaps it's possible to interpret this "negative energy" of gravitation in 3rd d-degree as analogous to the opposition in atomic shells between the potential energy in amplitudes and the kinetic energy as in frequency? Geometrically of the complementary type circular versus radial. There we could find a "positive energy" in the separation of shells and orbitals.

What Einstein interpreted as "gravitational radiation" through contraction of celestial masses, seems to correspond to the transformation of energy from high amplitudes of excited electrons, through jumps inwards, into energy of frequency type in outward radiation.

In the literature one meets the expression "***the potential energy of magnetic fields***". If magnetic fields may be regarded as "potential", this could point to the connection we have assumed in this model between gravitation and magnetic fields?

4. Mass as result of inversions of fields or of acceleration?

In the file about **Mass and Matter** we have mentioned the possibility to interpret Mass in terms of inverted Acceleration, of negative acceleration in that case. This in the same way as we have presumed that **Charge** would be a property definable in terms of braking of motion, negative velocity. With **Velocity** suggested as expression for steps between dimension degrees, it seems natural that the analysis also could be carried out in terms of fields in different d-degrees.
   We have Gravitation as a form of inward directed acceleration (*Acc*),
   One form of inward direction = inversions to the realities between 0 and 1. (Negative or positive.)
   If G is proportional to or equivalent with - *Acc*, and Mass proportional to 1/- **Acc**, so we get M proportional to **1/G**.

There is a formula (from Newton) were we have Gravitation in inverted form, **1/G2**. It expresses how celestial bodies are forced to move in orbitals, i.e. rotate.*(McGraw & Hill Encyclopedia)*. An **"inverse-square gravitational field of force requires a body to move in an orbital that is a circle, ellipse, parabola, or hyperbola"**
   Without pretending any deeper insight in the mathematics, it could be said that the formula points to a factor of inversion in what we have described as the d-degree step 4→3, leading to external rotation, even if it here doesn't concern rotation around the own axis of a celestial body.

What is called "**quaternions**" are hypercomplex numbers representing points in a 4-dimensional space. They are used in studies of rotation of objects about their own axes. Here 3 of 4 factors in such a number *q* are imaginary, *i2 = j2 = k2 = ijk = -1*. Its conjugate *(a -bi - cj - dj)* is the same as the inverse quaternion *1/q* when referring to a unit number 1 as the axis. (*Wikipedia*.) Again it seems that we in this advanced mathematics could find support for the idea of inversions connected with d-degree step 4→3. Here applied to vector fields.

5. Is it possible to physically identify a unity of G and A?

It doesn't seem so. This central question about the suggested scheme in our model remains. How identify the unpolarized, "superposed" states in d-degrees 4, 3, 2, assumed as binding forces in relation to the polarized states: divergent — convergent vector fields, Mass — Vacant Space, charges (+) — (-) ?

There is only geometries - or interaction through quanta of fields, the motional aspect of which in our model may be regarded as debranched in the d-degree steps and thus a testimony of an internal relationship ?

One aspect could possibly be to look for an "E0-line" between $E = +mc^2$ and $E = -mc^2$, where we can imagine that the polarization between FG and FA on a basic level has occurred? We could imagine such E0-points or -lines as more or less mysterious entrance doors to the higher dimension degree, this one as a "superposition" in quantum mechanical terms?

There are density waves in macrocosm, (which *Bengt Lindblad* suggested as explanation for spiral galaxies), one expression for the relation Mass — Vacant Space. We could identify the orbitals of the stars in the galaxy as such "E0-lines", the motions not demanding any energy in Newton's terms.

We could regard the distribution of electrons in shells around heavier atoms as similar "density waves" (with Schrödinger's wave functions) on another level. Perhaps connected is the notable fact (?) that the rotation of electrons about the nucleus doesn't produce any photons.

Could the potential barrier in the atom, separating nucleus (+) from e-shells (-) in some sense represent an "E0-line" *in its shape itself* ? Connected with the "tunnel effect" when alpha particles sometimes slip through the barrier without the usually necessary energy?

6. Complementary "poles" versus similar units:

It's necessary to distinguish between on one hand relations between complementary "poles" as Mass --- Vacant Space (or +/- $E = mc^2$) or protons — electrons and on the other hand relations between similar units as Mass — Mass, p — p, q — q, e — e.

Interactions between similar units (most elementary quanta) are evidently that which is identified as "forces" in the Standard model, but not primarily in our model.

The assumption in our model implies a "binding force" and a "polarizing force" together defining the complementary relation Mass ---Vacant space, or E= +/- mc^2,

In relation to the Standard model it may seem as only a suggested, vague formulation, departing from the Whole, without content, however real this polarization is.

But a binding force between protons and electrons in atoms is difficult to deny, and it was earlier identified as the electromagnetic force. The relation p — e includes both attraction and repulsion moments. (The same seems to be valid for electron pairs of opposite, complementary spin.)

Among celestial bodies (the relation between similar units as Mass 1— Mass 2) there is both the separation, interpretable as result of a polarizing, separating force, and attraction, as a binding force between the separated masses, so in solar systems and galaxies.

(Why don't all the masses in a galaxy or solar system contract to one? There is G and the factor **1/G2** in the formula above for the orbitals of the bound masses.)

Hence, it would (only?) be possible to recognize the "unpolarized " state of higher d-degree which was looked for above, (a superposition of two forces), as manifesting itself in this very relation, - on a new level.

Assume that interaction between similar units shall be regarded as a superposed level, versus a dimension chain with relations between complementary "poles" (or partial structures):

Then, one aspect in terms of our elementary model, would be the "pole exchange"

occurring in the last step. In d-degree 0/00, the degree of Motions, "motions from each other" are derived from first 0-pole and outward direction, but define an anticenter, a 00'-pole for inward direction on next higher level. "Motions toward each other", derived from primary 00-pole, likewise define a secondary 0'-pole, a center for outward direction.

On this second level G and A, Gravitation and outward Acceleration should appear with reversed roles: Gravitation acting as a binding force, Acceleration outwards as the separating, polarizing one. The opposition to first proposed identifications of "poles" 4a — 4b.

(The same may be said about the relations between protons and electrons versus p-p-relations (or between quarks) and e — e-relations.)

7. Gravitation as a pushing or pulling force:

How should we after all understand Gravitation as an "attractive force"? Is the "attraction" in reality a *pulling* force, emanating from a center, a 0-pole, not a *pushing* one from outside as the 00-pole, a pressure inwards?

The first case seems to agree with identifications here on the elementary level, Gravitation as an inward directed vector field. Compare the description by a physicist of Gravitation as "a kind of pressure from outside", versus FA as a kind if pressure from inside.

On the second level, with Gravitation appearing as a binding force, it should emanate from the 0-pole, a center in the conceptual structure here. Hence with the character of a pulling force? If so, it should be connected with the gravitational center rather than the Mass center of each atom or celestial cloud or body?

*

x1. MACROCOSM

Gravity waves – Dark matter – Antimatter – Holograms etc.

Some short thoughts

About

1. Gravity waves — where are they? A thought:
Let's assume that all waves as such are a sewing together of complementary fields. A communication in a certain dimension degree (d-degree) between its complementary poles in our model.
- In transversal EM-waves between electric and magnet fields.
- In longitudinal "gravity waves", a sewing together between Mass and Space.
Then the assumed gravity waves should in reality be "GA-waves", a communication between the gravity force F_G and the outward acceleration one (F_A).

   If so, where to find them? A combination of a centrifugal force, reevaluated as a force in its own right, and a centripetal force *?

   Hence we could suspect that these GA-waves are identical with the very rotation of celestial bodies (also the spin of micro-particles?), expression for the communication Mass - Space.

*As long as this doesn't crash totally in the depth of black holes.

A pair of neutron stars that rotate around each other and are observed to come closer to one another with time has been mentioned as a proof of lost energy, interpreted as emission of gravity waves. (If rightly understood.)

   Could eventually the "lost" energy - or distance, a factor of Space - be transformed to a still faster rotation of the neutron stars, equivalent with a shorter wavelength?

Where to find the "graviton" in this case? In units of a year!? Half a year or multiples of it? All motions regarded as translations between Distance and Time.
_____

About

2. "Dark matter! - "Dark energy":
One origin for the idea that Universe must be filled with much "dark matter" besides visible galaxies and dust is said to be an observation of peripheral stars of a galaxy: that these rotated at the same speed as inner ones, not slower. If galaxies rotated more like stiff bodies, the conclusion would be that they ought to contain much more "matter" than calculated. Several candidates for such matter have been proposed.

   Now, in another context, it's said that most of the mass of a proton in nuclei of atoms lies in the binding energy. (Quarks have only a tiny part of a few MeV of their total mass, near 1 GeV.) Mass and energy equivalent according to the $E = mc2$.

   A non-scientist may ask why not the same could be true for galaxies, that most of their mass lies in the binding energy itself - which we usually connect with Gravity. (?)

In the elementary model here the forces are regarded as an underlying level of higher d-degree than mass and particles.

   Could we simply identify dark "energy" with these underlying forces as relations, thus with Gravity itself?

In quantum field theory the strong force in atomic nuclei is a field where the force is carried by assumed "gluons", i. e., massless bosons. A gravity field is carried by assumed, hitherto not identified, "gravitons", also massless bosons.

About

3. "Antimatter" - and why this Universe is built of matter:
Physicists of today seem trapped in the thoughts of symmetries and wonder why our Universe not as well was created by antimatter like negative protons and "positrons" instead of electrons.

There are the two answers of Einstein's formula: $E = + mc2$ and $E = - mc2$
as divided by an E0-line.

Antiprotons etceteras are created in laboratories with the help of positive energy as if they filled "holes" of negative energy up to its positive level. (Cf. file about the **propagation of light**.)

Simultaneously, antimatter in the physicists' sense seems primarily at least be a question of charge *, the reversed signs.

A simple suggestion is to regard a plane coordinate system, where the x- and y-axes get plus and minus halves:

```
                   |   Matter
        -x, +y     |   +x, +y
       _____|_____
        -x, -y     |   +x, -y
   Vacant Space    |   Antimatter
```

Fig M-1: Matter - "Antimatter"

It gives 4 separate quadrants, clockwise +x,+y, +x, -y, -x, -y and -x, +y.
Identifying +x/+y quadrant as the one for our positive protons and matter, we have the primary antimatter in the -x/-y quadrant, "anti" in the double aspect of both mass and charge; mass presumed here as a deeper property of higher d-degree than charge.

The -/- quadrant should be identified with Vacant Space, the fundamental antimatter. It implies complementarity - and basic asymmetry.

The physicists' created antiparticles would we find in quadrant +x, -y (or perhaps in -x, +y) as just mirrored once around half an axes, not through the origin.

*When particle physicists give equal reality to antiquarks, with equal positive mass as quarks, it's the charge they indicate as reversed.

About

4. Entropy and unidirectional of Time:
It was said in a TV-program about Time that its (mathematically) mysterious unidirectional according to some physicists could be explained by the (similar) "law" of entropy: imagined as an inevitable way of Universe towards increasing disorder since Big Bang. Entropy also implying a way to energy forms of lower quality.

This talk must sound as nonsense for most people. What happens in stars for instance in the fusion to higher order of heavier elements?! And in all building of molecules and in the development of life and all complex processes in our brains (if not in the physicists')?!

(Doesn't even the map of the background radiation from earliest time after Big Bang show on a first order of higher versus lower radiating areas in macrocosm?)
_____

About

5. Multi-universa?
It feels quite enough with one. However, it's said that physicists occupied with the **String theory** have found that their seven or so hidden, rolled up dimensions may be conglomerated in an imaginable amount of ways (10500!), which should allow for an immense amount of Universes.

Doesn't it lie nearer at hand to think that these folded dimensions are expressed in the development of life and all the universes of different species and in our brains?

Order cannot simply be high energy. Our power stations give high tension but without transformer stations the order of societies would be much less.

_____

About

6. Universe as hologram?
Possibly physicists are only a bit careless when speaking in TV for the general public presenting a theory about Universe as a hologram. They say that perhaps we live in a 2-dimensional world, which just illustrates a 3-dimensional one through the same technology as hologram pictures. Why not extrapolate - or rather interpolate - and think of our "3-dimensional" world as a hologram of a 4-dimensional one?

The background thought seems to be that "information bits" cannot be destroyed and thus could be stored at the border of black holes in macrocosm as a spherical surface of information (like a history book?), while only the mass property disappears.

With no knowledge about the arguments behind these speculations, it may yet be allowed to put a question about properties of light:

In holograms making 2-dimensional pictures of a 3-dimensional object, the phase property of light beams is used. Which further property of light could be used in a step from 4- to a 3-dimensional illustration of structures? Besides a much broader bandwidth? The spin? Relations between angular momenta? Or something else...?

_____

About

7. Three-dimensional space?
In which sense does a 3-dimensional Space exist? Is it only an artifact?

It may be practical, a way to identify the position of a point in the closer neighborhood if the coordinate axes are orthogonal and independent of one another.

But how, if the coordinate axes are wavy ones, perhaps even frequency modulated, not orthogonal but in changing angles to one another - and deeply interdependent through the common origin?

(With dimensions defined as the relation between complementary poles as in this model, it could be similar to a political discussion within a group where many complementary views are included in the interactions.)

_____

About

8. Black holes and what's at their bottom:
One natural guess among others about black holes from the viewpoints in **this model** is that they in the bottom reaches the common source to the surroundings, that we there

may imagine a transition to expanding Space, its complementary pole, the real "antimatter". ?
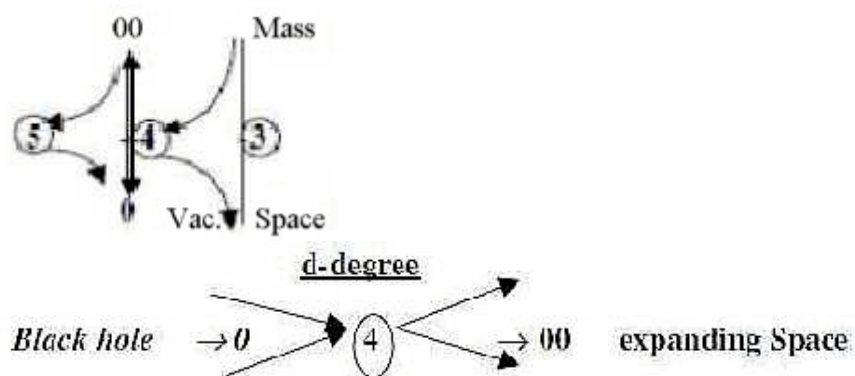

Fig M-2a, b:: A return of mass to its origin in d-degree 4?

_____

x2. QUANTUM MECHANICS

Entanglement – Observers' impact – Probabilities   etc.

Some short thoughts

About

1a. "Entanglement" in quantum physics:
One of the mysteries that physicists don't understand within quantum mechanics is the observation that when e.g. two photons are emitted in different directions, they are always complementary in their direction of spin (clockwise - anti-clockwise), however far they are sent from each other.

   Einstein, in a discussion with Bohr, meant that the photons must have been complementary from "start" like a right-hand glove and a lesft-hand glove. While Bohr believed in a kind of invisible connection. It's now regarded as proved through Bell's theorem and Aspect's experiments* that Bohr was right and there must be a so-called "entanglement" between the two photons. However, what says that not both were right? Especially from the views of the model (länk) here where complementarity is the fundamental principle behind the concept of dimensions?

How to interpret this entanglement - where any connection via something in light velocity is excluded?
- Could we interpret it as just a primary definition of d-degree 1 in our model, equivalent with Distance as physical concept and timeless?
- Another suggestion is to understand the entanglement in terms of a memory, a memory from underlying, deeper (~ higher) dimension degrees (d-degrees), like memories can connect us with people far away.
   These two suggestions are naturally linked in our model, since 1 d-degree get debranched in each step from higher to lower d-degrees.

*Aspect's experiment implied measurements of the branched way of the two photons in perpendicular directions, thus was a 2-dimensional measurement.
   If there were no coupling between the two outcomes, the maximum result of Bell's formula should be +/- 2 (details and math here neglected), But the experiments did show on a maximum of +/- $2\sqrt{2}$, the expected result of an entanglement
   What could be the result in a 3-dimensionl measurement?

Assuming the definition of a dimension as characterized by two complementary "end-poles" (a-b, c-d in the figure), the shortest step between the poles b-a in an 1-dimensional world would be 2 r and the shortest step in a 2-dimensional world could be $2\sqrt{2}$, b-d-a., i.e., via d-degree 2.
   In a 3-dimensional world, the shortest way could perhaps be a circular one?

Fig Q-1: A way to imagine Aspect's two results?

The entanglement should become an expression for what we have seen as the outer connection = the unpolarized lower d-degree 1 (b-a) in this example as the element of a structure, (no motion).

A note about the entanglement: Suppose we have a jelly roll, spiralled towards us and cut two *equal* slices of it, then lay them down, separating them outwards. The slices get opposite "spin", spiralled clockwise - anticlockwise.

This is just because division, the polarization, occurs from a *center*, the one between them, and the force is the *direction "outwards",* only defined as that through the relation to a center. (Couldn't it support the basic postulates in the model here?)

_____

About

1b. The ENCODE Project: (http://www.genome.gov/10005107)
DNA in our cells includes a lot of parts that are not genes and don't code for proteins. In the ENCODE project thousands of scientists are trying to understand the role of these other parts. Much of what they find concerns the regulation of genes, which genes are transcribed when and such things through "transcription factors". There are small RNA strings too, which appear as intermediaries in the "3-dimensional" network.

A similarity with syntax or grammar of a language in relation to spoken words feels obvious.

One kind of operation is called "RNA-editing". A usual such editing seems to be the exchange of an A-nucleotide to a G-nucleotide, a process that goes via the **common parent of both,** Inosine (I).
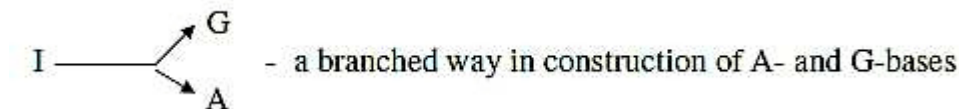
Fig Q-2: RNA-editing A → G via Inosine

This RNA-editing resembles the guess about black holes (point 8 in **file x1)**, an exchange via the common source, before a step of polarization.
(What's known about the function of this editing?)
_____

About

2. Impact of observations in quantum mechanical experiments?
It's often expressed in that way, that the very observation or measurement has an impact on the results of an experiment.

The wave functions of a photon don't allow for deciding a position of the quanta when emitted in a room, only for probabilities of where it may be. First an observation, a measurement, "get it" to exist as a "particle", or gives an answer Yes, here it is, or No, not here.

If this description is correct (?), maybe not), then the "impact" of observers on the outcome may be only that one certain direction is defined, to an eye or an instrument, through the very existence of these receptors, nothing else?

We could perhaps find a similarity with someone who talks in a room, creating sound waves. Only the ear of a listener can imply that the waves become particularized words - but cannot be said to have any impact on the distribution of waves as such in the room?

(However, about the photon: if e.g. 5 measurements are made in different positions in the room simultaneously, could more than one of them give a Yes answer?

Repeated measurements should give a pattern of probabilities.)
_____

About

3. Probabilities in quantum mechanics:
A quanta as a photon, regarded as a particle, should have a certain, identifiable position in a space at each moment. This is not allowed in quantum mechanics (Heisenberg's uncertainty principle). Through wave functions it's only possible to decide its position in terms of probabilities of its existence here or there.

This probability is the square of the amplitude of the wave.

Since amplitude is a distance from some zero-line, it's 1-dimensional. Thus, the square of it and hence a probability should be a 2-dimensional property.

When probabilities in physicists' calculations become = 1 or even >1 it seems to be regarded as wrong answers. Hence, the amplitudes of a wave should never be allowed to be 1, equal to its wavelength (?) or higher. (See a speculation in p.4 below.)

However, couldn't we suspect that a probability = 1 just becomes a truth - or more than true if with higher values, revealing a deeper, more comprehensive reality?

The "wrong" answer could be suspected to represent a step (a quantum jump) toward a higher d-degree, 2 to d-degree 3 (or even higher), where new rules prevail, with the wave functions now identified as non-linear ones with relevance limited to lower d-degree(s)?

How do jumps of electrons between orbitals in Bohr's atomic model get transformed to wave functions of emitted photons? Some momentary transition via a wave phase? In the Lyman-Balmer-Paschen-Brackett series for calculation of wave lengths of spectral lines from hydrogen, the inversion of wave lengths are given by intervals between inverted integers squared, from numbers 1, 2, 3, 4 to next higher integers (times a constant).

_____

About

4. Particle - wave duality of light:
A very simple-minded speculation:
Are there possibly some internal changes like partial inversions when a wave transforms to a particularized quantum? Some special factor or factors changing in the wave functions as a condition for getting "strength" enough (packed enough) to serve as a particle?

In basic lectures of physics a sine wave is described as a projection outwards of a rotating vector in a unity circle:
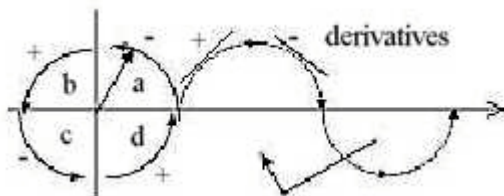
Fig.Q-3: Particle - wave

The projection implies that e.g. upper half of a turn of the rotating vector, from 0o to 180o, is mirrored, with derivatives changing signs in directions.

Simultaneously, if the sine wave shall transform back from wavy type to a circle (like a particle), there has to be a change in the phase of half a wavelength. In inward direction a reverse of the phase. It could resemble how a water wave, when meeting a hindrance, brakes and its kinetic energy of motion gets built in into the wavy

structure...?

Cf. particles described by physicists as "motions in fields" - "of enough strength" (said about Higgs particle in TV).

_____

About

5. Transformation of photons through steps in a dimension chain?
It's now and then said by physicists that a photon emitted from a source in an experiment may be overall in the room before it's finally get detected somewhere (as waves or quanta). Suppose it is, really overall.

With our model (länk) in mind, we could test to think of the photon's "phases" of existence as a chain of d-degree steps:

a) The very emission from the source as a center seen in terms of divergence, direction outwards from a 0-pole, d-degree 4 to 4b.

b) The room filled with the photon as a transformation to its 3-dimensional existence (possible to interpret perhaps in terms of an invisible substance), where one pole geometrically remains radial in the primary, geometrical definitions of our model.

c) Meeting a plane screen with slits transformed to a 2-dimensional surface wave.

d) Linear, 1-dimensional pathways of the wave getting more or less selected by the slits (?), simultaneously as d-degree 1, which in our model has the outer poles 2a - 2 (~ max - min of waves).

e) The last step 1 to 0 (the photon as a point) has the "outer poles" 1a - 1b. Hence, the polarization into complementary light - dark stripes will appear - as an endogenous property. (?)

_____

x3. Englert - Higgs theory, Higgs boson
and the Standard Model

Some annotations and comparisons with the model here

The Nobel Price went to Francois Englert and Peter Higgs 2013 for their theory about a way within quantum field physics to allow for a "broken symmetry" that could introduce a new field, with which particles could interact to get mass,s equivalent with inertia.

Annotations after reading (and not understanding much of it) 2 articles (in Physical Review 1964-65) by P. Higgs and two books about Higgs' particle:
- Sean Caroll: The particle at the end of Universe, 2012 [SC],
- Leon Lederman: with Dick Teresi: The God Particle. If the Universe Is the Answer, What Is the Question? 1993 [LL].

1. Symmetries:

The physicists seem really trapped in their hunt for "Symmetry" - symmetries, some only approximate, of different kinds ("local"," global", "gauge" and other terms they use), which makes their papers a mess for the not initiated — like talk of Latin priests during medieval times. It seems that the interpreters themselves have big difficulties to understand the theories and express these in words. Englert and Higgs seem to have found just a loophole in the law of an earlier theory with its demand for symmetry.
   Symmetry seems to mean that things are alike and at bottom everything should be alike, i.e. the same. In super symmetry theories also particles with mass and carriers of forces should be the same particles. The physicists state for instance an identity between electrons and neutrinos - under the condition that they didn't had different masses (!) and sometimes also neglect the difference between charged and not charged particles. This makes them seem a bit helpless in their hunt for symmetry- as searching for the Unity "the other way around", i. e., from anticenter, the 00-pole, inwards. A unity corresponding to the Entirety of d-degree 5 in **the model here**.

(Apart from that, is symmetry of a circle or a square the most beautiful? What about the golden section?)

Departing from the Big Bang theory it seems more natural to regard the first disunion expressed in the relation center - anticenter. This polarity and first step $5 \rightarrow 4$ with poles 0 --- 00 gives the basis for asymmetry in our model .(Welcome out!)
   Cf. how the physicists, after a lot of struggle with different symmetries, introduce a "symmetry breaking" through a "relation to the environment" [SC].
   Complementarity as a fundamental principle seems to be a more natural consequence of Big Bang and following polarizations and processes of "disunion",

Center displacement becomes one essential concept in the model here - and it seems to lie behind the mathematicians' differentiation of "local" versus "global symmetries".

For simple-minded non-mathematicians it's easy to note that symmetry axes as mirror planes in circles or squares passes through the center, as well as in bilateral symmetry. (Cf. **5-4-3-merous plants** (p. 1).

No such symmetry, however, appears to exist between vectors inwards - outwards to <—> from a center like the acceleration forces FA for outward accelerating Space and FG, gravitation.

2. A new field 'up there' — representing a "potential energy":

The Englert - Higgs new field 'up' or 'out there' represents an anticenter in our terms in relation to 0 as center. Hence, it sounds not too curious that it has a resting value of positive energy (246 GeV), not Zero (0) as some other, more well-known fields.
   The new field is described also as "a reference frame for potential energy".

A natural first question is what this 'height' stands for. What gave it this rest energy? Regarded as a roof or a top flat, it should be the bearing walls of the flat below. Reasonably we could suspect it to be some expression for the original, divergent FA-force, mostly dismissed in these books, if not indirectly dealt with through the weak interaction force.

Another question concerns the curiously exact value of its energy, 246 GeV. (It corresponds to the mass of about 262 protons, a bit higher than a Uranium atom, if binding energy should be neglected).
   What does this value represent? It's a measure in mass units, the same used for mass of fermions as protons etc., but the field isn't attributed mass in itself (if rightly understood).
   Could it represent the very distance from a first center in units of Time or Space, not only in energy? Or be connected with the reach of strong interaction? Could it be a value resembling the value of background radiation from Big Bang in Universe, said to be about 2,73o Kelvin? Be translated somehow into units of temperature in a cooling Universe? (The calculations behind the theory include perhaps the answer?)

A third thing to observe is the reference to the concept "**potential**" energy. On Earth we usually connect it with heights and Gravity, a built-in, bound energy, not yet released by this force into motion, i.e., into kinetic energy, the opposite concept.

3. Gravity - Heaviness - Inertia:

The property mass is defined in terms of inertia.
   One metaphor used by physicists [SC}] and in TV-programs to describe the Higgs field is the passing of famous persons through a public; its strong attention like a Higgs field makes the passing of famous persons slow through much interaction with the public; they get mass equivalent with inertia. While unknown persons may pass through more or less "in the speed of light"
   However, how did the famous persons like particles become famous? What makes so-called "heavy names" in organizations "heavy"? The stories don't tell it. With this metaphor it may sound as if the heavy particles themselves created the public's attention, i.e., the Higgs field or at least activated it, lining it up in some order? (Probably an addiction to the metaphor?)

We can note that the famous persons in the metaphor **get mass through slowing down their velocity *** when passing the public and interacting with it.
   With Mass identified as the amount of energy encapsulated in an object at rest (one of the definition in the books), it includes a potential energy which we could identify as velocity being built-in into internal structural elements towards higher d-degrees in our

model. Or regarding it in the opposite direction, towards lower d-degrees: the potential energy not yet released into external motions.

* This aspect of passing slow, braking a velocity, reminds of the original idea behind the model here of **Charge** as such a property, a motional energy being built-in into structure. Charge, however, presumed here as a 2-dimensional property. Still one (quantized) brake could lead to Mass as 3-dimensional?
   (Cf. p.4 below.)

If the famous persons passing the room in the metaphor are attributed some heaviness as "heavy names" in some organization, how did they get it? Heaviness includes mass but refers also to acceleration, a property from Gravity, carelessly said to have nothing to do with mass. (Gravity is at least calculated as a product of masses divided by the square of the radius.) But the gravity force effects both massive and massless particles like photons of light (Einstein) *, and massive and holy balls fall equally fast to the ground (Galileo). Hence, Gravity can be interpreted as a more general force. This could be an argument for seeing the Gravity force as preceding the Mass property, a deeper one of higher d-degree as suggested in the model here. (An analysis in the opposite direction, inwards higher d-degrees, may perhaps give Mass before Gravity.)

Gravity is a vector field while Higgs field is a scalar one.
   The vector character of the Gravity field gets lost in the Mass property as in a d-degree step $4 \rightarrow 3$. Gravity curves the network of 4-dimensional "Space-time", or "heavy" masses do.
   It seems as if the physicists regard forces as secondary to mass, forces equal to "interaction", "connections", "exchange" of particles as "vibrations" in the field, hence, like people exchanging words with each other. (Cf. the names strong and weak interaction on the forces F**st** and F**w**.) It's said too that it is the strength of this interaction that decides the mass if particles. Obviously these forces are internal factors of mass, built-in components. Thus, even with this description it seems that forces represent a deeper level and precede mass.

*Why isn't Gravity included in quantum mechanics or in the Standard model? It seems that it just appears in a derived form, the one of the attraction factor in the electromagnetic force, in which physicists have found moments of both **attraction and repulsion**.

However, since mass is defined also as the amount of energy needed to push or pull a body, i. e., one from outside applied force. Then the inertia of the body to move should be possible to interpret as the created anti-force, a single, gathered one from Mass as such. In this sense even Mass at rest is a potential force if provoked or activated.
   (Cf. Newton, forces and anti-forces.)

Mass occupies space, forces not according to the physicists' strict rules. But what creates Space - and Time - if not the F$_A$-force at Big Bang - with Gravity F$_G$ born as complementary anti-force! The polarity Vacant Space versus Mass in our model becomes a secondary complementarity.

4. Geometries: vertical - horizontal:

In one metaphor for Higgs field [SC] we shall first imagine a pendulum hanging from the ceiling, stable when it points vertically downwards. Then imagine the same pendulum fixed on the floor, raised vertically upwards: a very unstable position, which

makes it fall "left or right" to an asymmetric position on the floor, horizontally. The latter case should illustrate the Higgs' field.

The geometrical step from an anti-parallel polarity (of 180o) to a transverse, perpendicular one (of 90o) in this metaphor corresponds roughly to the same geometrical change through d-degree step $4 \rightarrow 3$ in our model. (That's why one could associate to a 3-dimensional loom if such exist, where 2-dimensional layers of weave get bound together by a 3rd, transverse web.)

However, regarding the metaphor as illustrating both poles (FA and FG in d-degree 4 and Vacant Space <←—→> Mass in d-degree 3), ceiling and floor should somehow change positions to be more like the model here: the upper pendulum stretched out along the ceiling (anticenter) in rest (~ pole 3a, circular), the lower one from floor as a center still pointing upwards (as pole 3b, radial).

Alternatively, the metaphor of a pendulum, first from the ceiling, then from the floor, may be regarded as only illustrating one "pole" in our model: Gravity as inward = downward direction of d-degree 4a, then changing to a horizontal or transverse geometry when transformed to Mass, one pole of d-degree 3.

Higgs field is treated as a new (mathematically invented or discovered) field, and perhaps it's easier to imagine it as a 3rd field, even if it somehow would be a derivation from Gravity, a heir of Gravity and FA according to the model here.

5. Numbers 4 → 3 + 1:

There is the funny similarity with our model too in these very numbers, $4 \rightarrow 3 + 1$, since Higgs field is said to be derived from 4 scalar fields into 3 + 1 fields. There the similarity stops.

In our model the 1 d-degree as debranched in a step towards lower d-degrees should imply a release of an internal structural element to external kinetic energy, representing a step $1 \rightarrow 0/00$, expressed in external motion (as spin or a factor in rotation), - or in opposite direction 1 degree built-in to structure on the way "inwards" to higher d-degrees.

In the physicists' description the 3 scalar fields "get eaten" by the vector fields of the weak interaction force Fw, with its massive and charged W-bosons and Zo. The one (1) left remains scalar (or becomes scalar again?) and makes up the Higgs field.

Without competence to understand this description it may nevertheless give a couple of associations to the model here:

The physical property defined in first d-degree step $5 \rightarrow 4$ in our model is suggested as only "**Density**". It could be assumed as scalar fields (or gradients). The scalar type could eventually also be attributed to d-degree 4 when still unpolarized and first appear as vector fields, equivalent with forces, when polarized?

Further, the 00-pole of d-degree 4, representing inward direction from anticenter, may (as in a "haploid" dimension chain) be seen as meeting "the other way around" in the loop version, of the dimension chain, figure below. from the end of the dimension chain inwards towards higher d-degrees.

D-degree 4 may include one step $4 \rightarrow 3$ and "the other way around give 1 degree (or field!) as debranched.
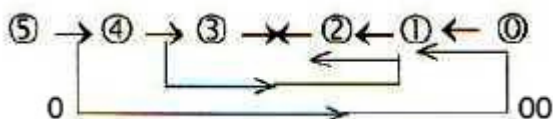
Fig H-1: "Loop" version of a 5-dimensional chain

If we identify the 1 degree debranched in step 4 → 3, we could this way get an idea of its brakes in velocity and of the intense interactions (motions, d-degree 0/00) at last step in the chain that gives mass..(First however charge!?

   The relation between Higgs field and the weak interaction force Fw seems curious and are hardly made clear in the books. However, in a dimension chain of forces in our model the d-degree step 1← 0/00 is assumed to represent one branch (neutrinos) of Fw, the other branch of this expressed in step 5 → 4 (anti-neutrinos). Perhaps the figure then could give a hint of that relation. (?)

The physicists' description of the step from 4 to 3 + 1 fields resembles in some way the oogenesis as polarizing steps in female flowers at a certain stage: a relation between what becomes the ovum, the egg, and the 3 other cells, which become the polar bodies, (fertilized triploid), and develops to endosperm and nourishment for the egg. If such an association could tell the physicists something interesting is an open question.
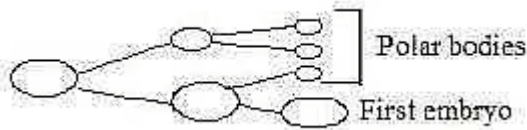
Fig H-2: Oogenesis in flowers
(after http://en.wikipedia.org/wiki/Oogenesis]

6. Fw, the force of weak interaction:

A main example of the weak force is the decay (or polarization) of a neutron outside an atomic nucleus into a proton plus an electron plus an anti-neutrino:
   n → p + e + anti-v.
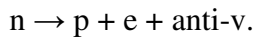
The bosons of Fw that makes the standard model look so ugly, were first invented by physicists of pure fear of an infinity. Their calculations gave the electron "infinite mass" at high energies. * To avoid this mathematical monster they invented the W- and Z-particles as a kind of intermediaries (and later found them as they always a bit suspiciously seem to find the particles they look for).

*(Since mass now is described as a measure of the strength in which particles 'interact with' the Higgs field, what should an infinite interaction = mass imply? Just identity - ! - with the Higgs field or with one field line in it? Cf. our **redefinition of "infinity"** as anticenter, a postulate.

   Decades ago it was told that a body got infinite mass in the velocity of light and further lost its depth dimension, became a surface, one kind of infinity..

These W- and Z-particles are 1) bosons, i.e., carriers of a force, 2) further massive, while other bosons are regarded as massless, and 3) furthermore charged, the W+/W-ones. Z not.

   In our model here it would imply properties from both d-degree 4, 3 and 2. Perhaps it would be possible to interpret these particles as representations of the main axis along the dimension chain from step 5 → 4 to step 1 ← ; 0/00? However, since the FA-force is dismissed, it would be only part of a truth, the bosons W and Z only to regard as daughters to the FA-force at Big Bang (?) when Space was created, combined with an inheritance from Gravity?

   In the chain of forces here the electromagnetic force is proposed defined in d-degree step 3 2, and physicists have found a connection in terms of the "electroweak" force.

Fw as well as Higgs field implies a "broken symmetry", since parity is lost at weak interaction. When e.g. pions decay into myons, these are mostly emitted in one direction along an axis of type "left - right". For anti-particles, however, the direction is said to be the opposite. It sounds at least that if we included the polarity matter - real antimatter, it could maintain a parity, one of a deeper kind. (E = -/+ mc2.).

Such a deeper parity may need two mirroring steps to appear, "vertically and horizontally" with reference to figure **M-1 in x1-file**
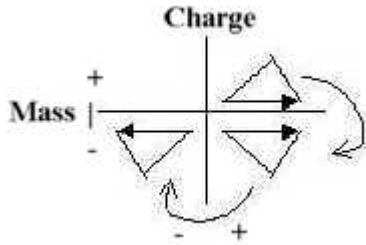
Fig H-3: Two mirroring steps to real anti-matter

If this view have sense it could be an argument for identifying Fw as a deep force from d-degree 5 to 4 or derived from this step that breaks a symmetry.

There is no symmetry between a force of divergence and one of convergence.

(There is talk about protons and neutrons as "approximately" symmetric, but at the same time assumed that a change n → p implies a turn from an up-quark of +2/3 to a down-quark of -1/3: Where the similarity, not in charge, nor even in mass, so all this talk about symmetries seems open for a certain mistrust.)

7. Higgs bosons and field filling Space"?

Higgs boson is a scalar one with spin 0, as if the spin 2 of Gravity had been polarized into -/+1:

(-1) → origin ← (+1); difference 2, sum 0. Cf. the pion →← . (?)

Mass of Higgs boson is said to be circa 125 GeV, hence about half of the potential energy of Higgs field itself (246 GeV).

It's said that Higgs field should fill the whole "vacant space". The same is often thought about neutrinos of the weak interaction force Fw. It may give an idea of Space filled with bubbles created through divergence and convergence as in two sine waves, figure H-4 below or sooner one plus its reflection and somehow expressions for Fw and Higgs field, ultimately from the fundamental forces F$_A$ and F$_G$?

Fig H-4: Bubbles of Higgs bosons and neutrinos in Space?

Higgs bosons can "decay" (what a word for these processes!) into some set of massless photons according to the descriptions, photons connected with sine waves.

8. Why fixed masses?

It's underlined in the books that the Englert-Higgs theory, now regarded as proved, doesn't give any answer of why particles with mass have their fixed rest masses.

We have the transverse relation of their field in relation to other phenomena and somehow the fermions could resemble notes with their stems on a music paper: Massless bosons imagined darting away along and between the lines, massive particles more or less from the transverse direction being caught by the field lines or strings of different thickness?! (Cf. longer or shorter jumps of electrons between orbitals in atoms?)

   (Could eventually a quantized angle of steradians of the "transverse" relation be included in this quantum field theory?)

Mass is described as a measure of the strength of interaction with the Higgs field. Which activities does this "interaction" imply? If we try to compare Higgs field with the global banking system of today that penetrates the whole world, with an immense lot of money representing only potential values, with a lot of shadow departments and only abstract figures in its computers, how can saving and borrowing particles keep their fixed masses? A robotized stock trading? It isn't easy to understand this business.

   Anyhow, quite another theory is obviously needed to explain the fixed rest masses of particles.

An imaginative view on masses of the Higgs, W- and -Z-bosons in GeV,   approximate numbers:
   Higgs boson from a scalar field, Fw-bosons from vector fields:
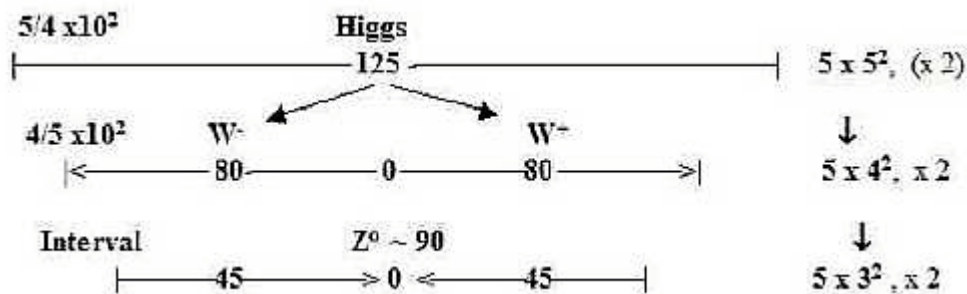
Fig H-5: Bosons in GeV

9. Reach and strength of forces:

Counting on 4 forces the established way, two of these have a long or infinite reach, gravity F_G and the electromagnetic one F_{EM}, two are usually attributed a short reach, the strong and weak interaction forces (Fst and Fw). It would express the kind of polarity $00 <\leftarrow\rightarrow> 0$ in reach according to the model here and correspond to macrocosm versus microcosm. Approximately also corresponding to forces from higher d-degrees versus lower ones in the files here about forces. One pair inwards as $F_G \rightarrow$ Fst, one more or less outwards, $Fw \rightarrow F_{EsM}$.

   A question mark for Fw: there is the presumption among physicists that neutrinos of Fw should be responsible for Big Bang itself (would rather be F_A). If so, at least one branch of this Fw-force seems possible to attribute a very long range if not passed on to its companion F_{EM} in the electroweak force. (?)

About the **strength** of forces, it's mentioned that the strong force is weaker near center, the target of the vector arrow, with growing strength further out. Thus, with Gravity very weak in atomic microcosm, both these inward directed forces should have their source of strength at the starting point of the arrows, at anticenter, the 00-pole (primary and secondary?) in our model. Similarly, the source of strength of the outward directed forces should be the opposite pole, the center or 0-pole - at least for one branch of Fw and the electric component in the electromagnetic force.

The Standard Model - some notes

All the particles in the standard model with some "braking symmetry" are just too many in number and character to satisfy anyone, if not some of the particle physicists themselves. Others not.

One may think, however, that this building in some way resembles a simple 3-dimensional coordinate system in numbers, with 3 axes, yet with different thickness, thin, medium and thick for the three 3 "families" * of quanta.

* Families eventually to regard as representing d-degrees 4, 3 and 2 (y-x-z-axes?) in a secondary dimension chain developed within step   4 →3, using the model on this site...

There are 6 outer poles as the 3 pairs of quarks (for fermions); there are 6 half axes, to identify with the 3 pairs of leptons, neutrinos-electrons. (Cf. factor 3 and first 3 cleavages of an egg in embryonic development.)

And there are 8 space quadrants - or 8 lines connecting the 6 poles - for the 8 assumed gluons of the strong force.
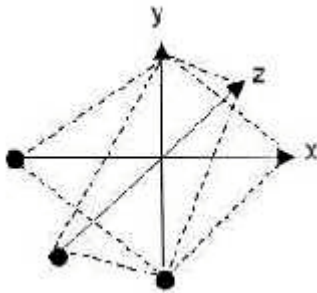
Fig H-6: Standard Model numbers in an x-y-z-system

With signs minus - plus on half axes and directions outwards - inwards in relation to the origin we get many different combinations, for instance one of the 3 planes combined with one pole of the third axis.

Perhaps we could imagine 3 half axes combined to the massive bosons of weak interaction with their anti-particles in the diagonally opposite space quadrant - or something like that? And there will be an ambiguous relation between massless gluons and mass as representing one quadrant. (The binding energy of massless gluons said to make up most of the mass of protons!)

Perhaps we also could imagine a polarization between half axes in relation to the origin to illustrate the birth of motions, like the phase displacement between electric and magnetic components in a light beam.

(Cf. spiral cleavage in certain type of embryos.)
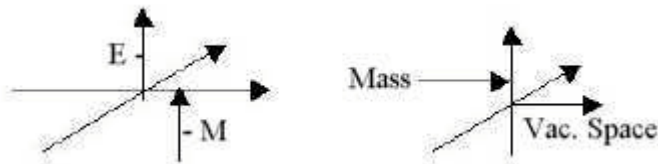
Fig H-7: Displacement along different axes

Now those physicists who love all particles are hoping for many new ones, even what is called "vacuons" and "zeroes" - particles (!) of Vacant Space - which somehow should become a bit less zero further out. It sounds as if they are on the track to find FA, the complementary pole to Gravity in the simple model here.

Physics began with 3-dimensional bodies, then, with a short digression into the 4-dimensional space-time, went on to 2-dimensional waves and 1-dimensional strings, and now arrive to 0-dimensional things - where they probably will meet Gravity and the monster of infinity once again?

END

Physics-del-II

More detailed survey of content in files on physics

<u>HOME</u>

<u>1. An alternative 5-dimensional model - presentation</u>
• The concept dimension and other definitions
• A dimension chain in geometrical terms
• Motions - first comments
• The dimension chain in concepts of physics
• Some first annotations: Complementarity, Entropy, 5 dimensions,
  Gradual substantiation. Incorporation of infinities
• Forces as concept
• Assumption about angle steps
• Level development
• Mathematics, one example

<u>2. Forces - MEGA-fields</u>
• MEGA-fields,
  (Magnetic (FM), electric (FE), gravitational (FG), outward acceleration (FA)
• FA, the outward acceleration force
• G - EM - connected with physical qualities
  - and strong (Fst) and weak (Fw) interaction?
• The reach of the forces
• G-M-p and A-E-e:, relationships
• G-waves and M-radiation, a note
• Mass, matter and Charges as "inversion" of vector fields
• G - EM: dimension degree relations
• "Carriers" of forces
• The 5th force?
• Strength and Weakness of forces
• Some problems
• Other sketched illustrations of forces in a dimension chain

<u>3. Nuclear and Weak Forces</u>
• The nuclear force
• Combination of other "forces" or fields
• Number 8
• In terms of Motions
• D-degree step 2-1? p - anti-p?
• Angle steps?
• Complementary force?
• Reach - to Uranium 238
• π-meson as carrier
• Quarks
• Weak Interaction
• Loss of "1/2"
• Participation in all d-degrees?
• Connected with which physical quantity?
• Parity

- Angle steps?
- Hardly interacts with matter?!
- The standard model:- new interpretations
- Three general aspects on the concept of forces
- About comparisons with the dimension model

4. Strength - Weakness of Forces:
- Only some general aspects

5. Mass - Matter - Vacant Space
- Fields - Mass/Matter-Charges-Waves
- Mass and Matter?
- Mass
- Mass as "inversion" of fields
- Mass as inertia
- Matter
- Spin - an aspect
- Vacant Space
- Density
- The "negative" energy...
- The matter is not so simple...
- Different degrees of Vacant Space and Gravitation
- Microcosm - Macrocosm
- Motions
- The E0-line
- Mass - Vacant space in relation to Distance and Time
- A curious question
- Is Vacant Space quantified?
- Some critical notes

6. Special notes about Mass and Vacant Space
- Waves before mass?
- Matter as de Broglie waves
- Splitting up or diffraction of the Mass
- Some numbers from earlier decades
- The lacking Mass in Universe: earlier and new estimates
- Can new matter be created in our Universe?
- Vacant Space and the Future

7. Antimatter - Anti-"Matter":
- General views
- Arguments for not imagining separate worlds of anti-matter

8. Charge
- What is "charge"?
- Charge as a 2-dimensional shell character
- Permeability
- "Embryo" of an atom, from mass to shell.
- Negative (inward) and / or "inverted" velocity?
- EM-fields and Charge
- The potential barrier?
- Spin 1/2
- Quarks - partial charges - and gastrulation
- Phase-displacement between E- and M-components?
- Some mathematical operations (??)

• Attraction - Repulsion between p and e, (a first note)
• Critical notes

9. Spin:
• Some statements about "invented" Spin
  (Pauli, Hawking, Newman)
• Rotation in the form of structure?
• Centrifugal and Coriolis forces
• Spin compared with other physical quantities
• Parallel and orthogonal spin axes
• Three figures from the original texts

10. Electromagnetic waves and other ones:
• Particles and waves - the double nature
• Longitudinal and transversal waves
• EM-waves:
• Structure
• Propagation
• Amplitude - Frequency
• Lyman-Balmer-Paschen-Brackett-series
  and RNA-base numbers -

11. EM-waves 2: Additional aspects and hypotheses:
• The velocity of light
• Length of a photon ?
• Hypothesis about polarization between longer and shorter wavelength
• Hypothesis about "side waves" in EM-fields
• Phase waves

12. Motions
• How to define motions?
• Motion as polarization of lines
• Motion as a force in itself
• Entropy
• Structure of motions - general scheme:
• Motions indifferent d-degrees
• Attraction - Repulsion
• Miscellaneous about motional patterns:
• Two examples or illustrations of d-degrees of motions
• Growing complexity of path movements
• Chemical and cyclic processes
• Motions as building workers,
• Motional patterns gradually substantiated
• Energy aspects

13. Velocity - some notes
• Velocity as d-degree steps
• Velocity as quotient between forces
• Five quantum steps as a series of derivations ?
• Positive and negative velocity

14. Temperature - some notes:
• Temperature - a concept for motion in microcosm
• Factors in kinetic energy of gases dimensionally interpreted

- A note about "mi-cells"
- Temperature in relation to velocity

15. Time - some notes
- Time as an aspect on relative motions...
- Time out of converging motions ?
- Space-time and time as "surface"
- Time poles 0 and 00
- The Past and the Future as directions of Time

16. Quantum Physics - some annotations:
- 4th dimension
- Direction more narrowly
- The uncertainty principle
- Wave-functions and their "collapses"
- Polarizations in opposites
- Superpositions
- Bell's theorem and Aspect's experiments
- "Immediate effects" and non-locality

1**7. Quantum Physics 2**
- The Particle - Wave duality

18. Einstein - some annotations
- Outwards - Inwards, and the "center" concept
- Motions pre-existing as structure elements in higher dimensional degrees
- The deflection of light around the sun:
  gravitation, curved space and/or influence of magnetic fields?
- Can the curvature of space or space-time replace the gravitational force?
- Can forces act over distances without mediation or not ?
- $E = -mc2$; Einstein and the imaginary world - and about EPR
- The rotation of the elliptic orbit of Mercury

19. String Theory (ST) - comparisons
- The level of analysis optional
- Dimensions as building stones
- Problems with the Infinity as a background to ST
- Number of dimensions
- "Undeveloped" dimensions ?
- Number 5 in ST
- Structural aspects in the reference:
- 1-2-3-brans, Calabi-Yau-rooms
- Polarities - Dualities in ST
- Fluctuations in Quantum mechanics
- The Mathematics of ST - and 11-dimensional
- Supergravitation
- Additional remarks:
- To unite Gravitation with Quantum mechanics
- Mass and Charge properties
- Why the littleness of strings?
- The 7th "undeveloped" room dimensions and fatty acids

20. From 4th to 3rd dimension degree - problematic issues
File I-II: Introduction - Rotation:
- The start of physics and Universe

_____

Curious things - a few from start of this site

1) Weak 0: **Spectral lines of the H-atom and the RNA-bases**
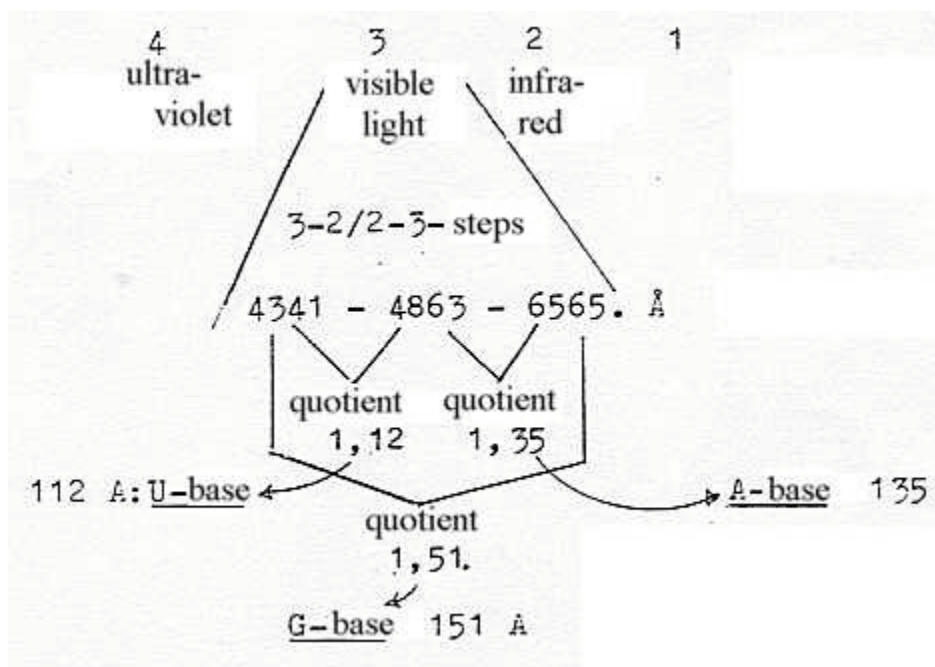
The curious thing of the week:

Spectral lines of the hydrogen atom, quotients between their wave lengths - and the numbers of the RNA-bases U, A, G:
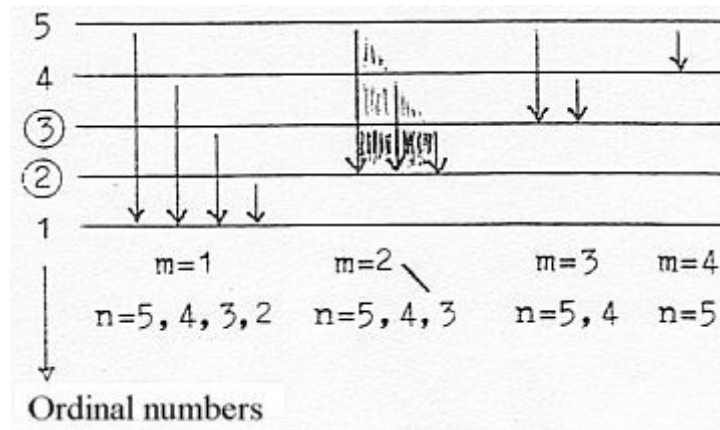
$$\frac{1}{\lambda} = \text{constant} \quad R \left(\frac{1}{m^2} - \frac{1}{n^2} \right)$$
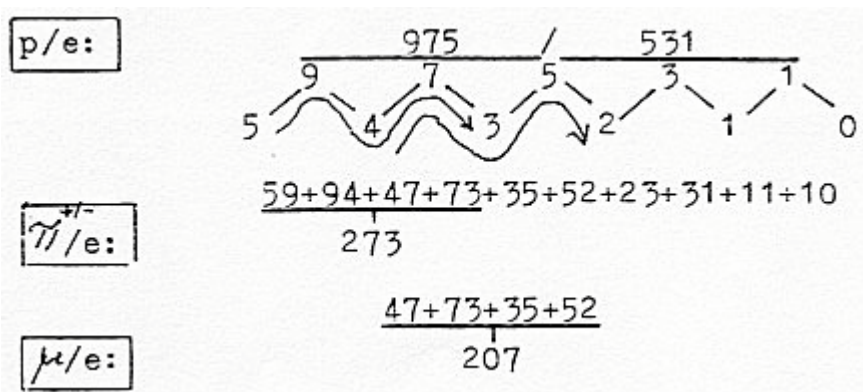
Rydberg's constant: $1{,}0967758 \times 10^{-7}/m$

See **Electromagnetic waves about the Lyman-Balmer-Paschen-Brackett-series**

2) **Elementary particles: Mass quotients in a dimension chain:**

p/e =1836,12....   975.000 / 531 = 1836,158

p/e - π - μ - numbers - and a K -meson: $x10^3$

p/e:
$$\frac{975}{} \Big/ \frac{531}{}$$

9 7 5 3 1

5 4 3 2 1 0

$\frac{\pi^{+/-}}{e}$:
$$\frac{59+94+47+73+35+52+23+31+11+10}{273}$$

$\frac{\mu}{e}$:
$$\frac{47+73+35+52}{207}$$

K°/e = 975, disintegrates into π-mesons. (Cf. **here**)

3) To 30 Mars 2006: **Uranium 238 A, 92 Z in a dimension chain**

Curious thing of the month   *(see Menu, "Chem. Elements")*

Uranium 238 - heaviest element in Nature
Mass number A = 238
Charge number Z = 92, Neutrons in the atom: N = 146

Triplet numbers out of a 5-dimensional chain

$\left.\begin{array}{l}543\\432\end{array}\right]$ 975

$\left.\begin{array}{l}321\\210\end{array}\right]$ 531

$$\frac{975}{531} + \frac{531}{975} \quad x10^2 = 238,08$$

**Compare 975/531 x 10^3 = 1836,156.~ the mass quotient
proton / electron.**

975/531 = 2 x 91,8. x 10^{-2} **2 x 92**
= Z+N equal as in alpha-particles.
531/975 = 54,46., x 10^{-2}: **54**. = surplus of N.

4) To 22 May 2006:

Curious thing of the month   *(see Menu, "Chem. Elements")*

$\binom{238}{92}U$: _Uran_, heaviest element in Nature

92 Z, 238 A

Dimension chain: 5 — 4 — 3   2 — 1 — 0

Mass   Charge

543 $\triangle_a$ x 1/2, x 10^5 = 92,08 ≈ 92. = Z U
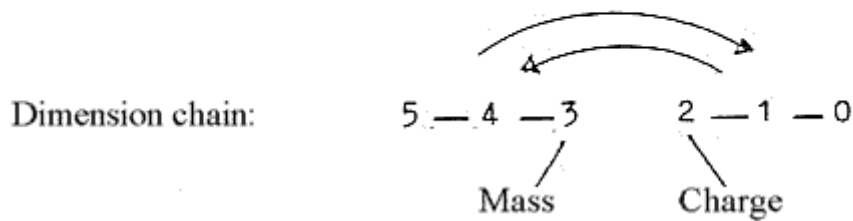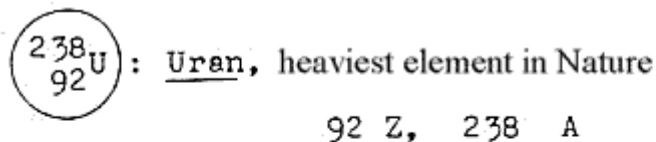
210 $\triangle_a$ x 1/2 x 10^5 = 238,09 ≈ 238. = A U

5) To 2006-08-02:

Curious thing of the month: the natural logarithm e:

5 — 4 — 3 — 2 — 1 — 0

5-e = 2,2817   e = 2,71828...

$\frac{543}{5-e}$ = 238. (237,98) Uran. = A-number

$\frac{210}{5-e}$ = 92. (92,04) Uran. = Z-number

6) To 2006-10-08:

Curious thing of the month:

Distances - scale of Universe, meter:
10^{-15} —————————→ 10^{+26}: Middle $10^{+5,5}$
Φ atom nucleus   Φ Universe

Time scale, seconds:
10^{-23} —————————→ 10^{+18} Middle $10^{-2,5}$
Time for light   ~ Age of Universe
to pass a proton

Quotient between middle of scales $10^{+5,5}$ / $10^{-2,5} = 10^8$, m/s,
~ the 10-power of light.

7)To 2006-11-04:

8) T0 2007-04-18:

END