Motion

1) First general aspects:

- In mainstream physics with its "4-dimensional space-time" motion as such seems to be hidden in the concepts of Time - or Velocity - or "Interaction", without any place in its own right. (Why all these motions?) Yet, motions are perhaps the main object for the physicists' studies and their equations.

- Motion as concept could be expressed as **the communication between +E=mc^2 and -E=mc^2** and between "matter" and "antimatter in all different d-degrees of complementarity.
    In what occurs motions? A relatively empty space as "anti-matter" is a condition for external motions of material bodies. (Even physicists as Mach who didn't like the concept of a Space with an own reality, had flats to move around in.)

- Motions is also to perceive as **the transformation of the 5th d-degree, the Entirety**, into all lower dimension degrees, all motions of Universe as the expression for the Entirety as first binding force, a perpetual translation...
    Doesn't "anti-matter" in some sense exist just in all cases of *events*!

- Time has been called "an aspect on the relative motions of bodies" Distance as concept could of course likewise be called an aspect on the relative positions of bodies, and Motions an **aspect on the relative changes in distances**.

- Hence, Motion becomes **the derivative of Distances**,

- Motion has been identified as **a relative history** since Galilei.
Yes, there is obviously a need for something external to relate the motion to for the possibility to observe it. But at the same time Einstein who stressed this relativity, still regarded - or used - the velocity of light as "absolute" in some way. How can velocity be "absolute" but motion not ?

- Motion could also be described **as a "transformation of Distance into Time"**: 30 miles to our goal, time zero; 0 miles to our goal when we arrive, time +5 hours.
   But behind our backs, the Distance reappears again!
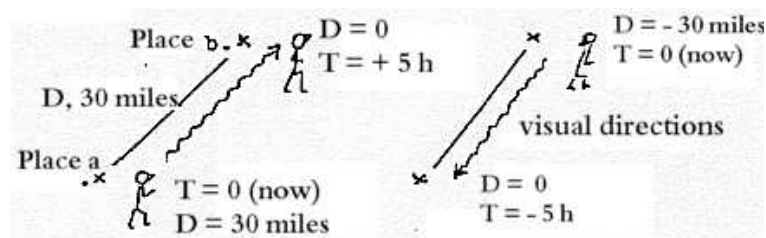
- **Distances is double directed, Time one-way directed**. According to main principles in this model, this indicates that Time is a result of more polarizations, a polarization of Distances.
    Hence, it should not be quite logical to see Distance and Time as complementary poles of d-degree 1 as in the original texts but rather perhaps the "quanta" of Distances in motions:

Motion as polarization of lines:
- In this model Motion is identified as polarization of a line, that is of an 1-dimensional entity: - into the poles 1a (movements towards each other, and 1b (movements from each other):
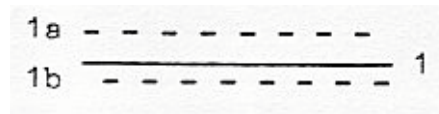
All inherent motions implies 2 poles and should be possible to describe as an pendulating between two poles of convergence and divergence in some meaning. As striding. (And swimming, crawling, flying.) Even the chemical currents in an amoeba movement (perhaps as changes in density). A half step doesn't lead anywhere. In walking the pendulating of the gravitational centre of the body means a repeated crossing over the straight gravitational line.

    Is this aspect true also for rotating motions, the rotation of a planet around its own axis for instance? We shall return to the question further down.

(Compare the figure perhaps with the polarization of a light wave in left-right polarized photons, (some comments later about <u>fundamental experiments</u> in quantum physics) and of light waves into electron/positron pairs.)

- **Distance** - or 1-dimensional potentials, is according to this model the nearest **binding force in motions**,:that is between motions from and to.
    In human life this is mostly obvious, with goals for human walk and ways for transportation. But what is the goal for an emitted light wave or the like?
    In the motion of waves we have to look at the small displacements as quanta of distances, passing one change as energy to next one in linear propagation, - or as the phase displacement between E- and M components in electromagnetic waves, the common centre displacements along the propagation way, creating the longer distances.
    Compare human beings who are pregnant with their own further propagation, giving birth to next generation ("in empty space"), a transportation of "energy packages", not of themselves, into the future.

Motion as a force in itself
or only a result of forces? In classical physics motions or changes in motions were seen as the result of forces. But of course motions motions must be seen as forces in themselves too, as in this model.
    Each d-degree step towards lower d-degree in this model means 1 d-degree "branched off", translated into motions. And with d-degrees of structure seen as binding/polarizing forces in relation to one another, motions become results of forces. But as the last step in a dimension chain they should also be interpreted as the ultimate polarizing forces in underlying levels and binding forces in superposed levels.
    More elementary: a motion as a stroke in a battle is of course an acting force on the opponent (or call it "communication" !), but at the same time an expression for an inherent force (or "will") in the acting fighter.
    When physicist of today talk about forces as "interactions", they obviously see motions as forces, particles throwing bosons or other quanta on each other, or as simple push and pull activities.

Entropy
- and the opposite: With the dimension model here we have assumed a primary one-way direction from higher to lower d-degrees and more and more motion moments. This is

in accordance with the theses in physics about entropy, about a development towards ever more of "disordered" thermal movements, lower energy forms. But the validity of this law in the <u>whole</u> universe, not only in <u>partial</u> systems, has been questioned. Life, for example, is apparently a contradiction to it.

There is also this development towards superposed levels and life:motions translated to bonds, to structure, in the opposite direction of entropy.

In this dimension model we also have two possibilities,:to see it "linearly" (5→4→3→2→1→0/00) - or to look at it "perpendicular", (5→4→3→|←2 ←1 ←0/00) as developed from 5 and 0/00 inwards towards the middle step 3-2. This would mean that lower degrees and motions are incorporated and bound in structures of higher d-degrees.

According to the model we have also 4-dimensional fields in Universe underlying matter, which we can assume continue with structuring processes in cosmos, shaping stars and planets - and probably life.

We could presume that the first steps 5→4→3→ in the development of Universe from Big Bang have the nature of "exothermic" reactions, to borrow a concept from chemistry (and inflationary?).

2) Structure of motions:

As said in the Presentation of the model here we assume that each step in a dimension chain, implying a branching off of 1 d-degree,is translated into eternal movements. We get a dimension chain of motions in the opposite direction of the chain of structures or potentials.

Structure, d-degree:
$$5 \rightarrow 4 \rightarrow 3 \rightarrow 2 \rightarrow 1 \rightarrow 0/00$$
$$0/00 \leftarrow 1 \leftarrow 2 \leftarrow 3 \leftarrow 4 \leftarrow 5 \qquad \text{degree of Motions}$$

1. Path movement — describes a line.
2. Rotation — describes a surface.
3. Spiral forms of movements or other 3-dimensional movement — describes a volume.
4. Expansion / contraction — describes a 3-dimensional room: volume + directions inwards / outwards.
5. Pole exchange (0/00) — describes centre / anticentre in one moment.

Hence, - we should be able to identify

- an 1-dimensional path (or "translation") movement in 4-dimensional, radial vector fields, and attribute

- rotation to material bodies as 3-dimensional structures,

- spiralling or translations along 3 co-ordinate axes to charges or waves when analysed as 2-dimensional structures,

- expansion / contraction to 1-dimensional, linear entities as distances (an obvious fact in cosmos or a formalistic madness ?, see comments further down),

- pole exchanges (0/00) to 0-dimensional "units" or entities.

Comments and critical remarks:

One first general, critical comment is that there seems to be more motions than corresponding to "lost" d-degrees. A planet as the earth for instance seems to have both a rotation around its own axis and a path way movement around the sun - and its axis also rotates slowly over thousands of years.

It seems as if we have to count on an accumulative scheme, corresponding to different levels of d-degrees involved for the "3-dimensional" bodies ?

1-dimensional motions in 4th d-degree:
What kind of 1-dimensional motion could we relate to 4-dimensional vector fields (or a 4-dimensional "room")? The essence of the propagation concept, the Big Bang as creating distances, distances quantified in what we later call longitudinal waves as the assumed gravitational waves:

$\rightarrow 0 \leftarrow 00 \rightarrow 0 \leftarrow 00 \rightarrow 0 \leftarrow ...$

Also a quantifying of Density? In the more materialized world the vibration of individual quanta, or halved such vibration implying translation, path movements, $0 \rightarrow 00$?

A convincing identification of such a motion in 4-dimensional fields is of course essential for this 5-dimensional model. The newly recognised expansion of Universe (of "Vacant Space") is presumably the first, most obvious expression for this motion. It has been said in this connection that celestial bodies are not "flying away" from us, they are "carried away" by this expansion of the Space.

The opposite pole - the inward direction, from anticentre 00 with in infinite multitude of starting points for the vectors, can be understood as an answer to "Big Bang".

The two forces together - or 4-dimensional fields, would then give the result of curved, bound orbitals as path lines for celestial bodies as the earth or the sun: About d-degree step 4-3, see file 4 $\rightarrow$ 3 issues.)

Hence, we should be able to assign all such path movements (or translations) to a 4-dimensional field level. (So too in the propagation of electromagnetic waves, quantified 0-00-0-00 etc. through the quantified bonds in the atoms.)

Still, there remains a question mark: in the seemingly static gravitational field around the earth or the sun for example, or in a seemingly static electric potential between a plus and a minus pole, do we have some "external motion moment", perhaps not identified as such ?

The magnetic field of the earth has been slowly reversed over time. Perihelium of the planet orbitals is very slowly rotating, which Einstein explained for Mercury in some terms of gravitation. And perhaps, in microcosm, the weak interaction force (Fw), changing circumstances in atomic fields, could include expressions for such motion?

2-dimensional motions in 3rd d-degree:
Rotation, the 2-dimensional motion, is rather curious: Why all this rotation of big bodies in cosmos - planets and stars and galaxies - and of particles in microcosm ? Here meaning around their own axes. Shall it really be necessary?

Which terms should we use to be able to call it an explanation for it ?

One explanation in line with this model here is just that rotation as 2-dimensional is **the necessary translation of energy** when 2 d-degrees are lost in the structure (and matter as 3-dimensional is an effective way to pack energy).

Another more intricate view is an explanation in terms of **co-ordinate axes**: With one axis the nearest way between the outer poles is the diameter. With 2 orthogonal axes the

nearest bond between outer poles seems to be π, the arc of a circle. We should perhaps count on a polarization in "an elliptic and a hyperbolic geometry" with the angle step from 180° to 90° in d-degree 4→3 (between masses and vacant space) ?

   In this model there is also the principle of centre displacement towards superposed levels, where the anticentre on one level through pole exchange in the last step becomes the centre on next level etc. Then the surface of a closed unit could be regarded as centre in relation to superposed levels. (Cf. an external push on a ball toward its anticentre, giving in a rotation.)

3-dimensional motions in 2nd d-degree:
It will of course be more difficult in the 3rd step to draw the border between structure and motions of 2-dimensional phenomena.

   One example is electromagnetic waves, where we have simultaneous motions along 3 co-ordinate axes: the variations in the electric and the magnetic component as orthogonal - and the propagation. The wave could be described as a 2-dimensional field in translation between an electric and a magnetic component during propagation.

   A superposition of rotation and translation gives a spiral as motion through 3 dimensions. One example is electric charges in spiral movements around the magnetic field lines of the earth.

   Concerning atoms: With a change from a particle model of atoms to a shell model, there ought to follow one more d-degree in motions: does it ? Probably it should be seen in connection with the Schrödinger wave functions for electron shells and the impossibility to decide positions for electrons as particles at the same time. This means the impossibility to make an analysis of the structure in both d-degree 3 and 2 simultaneously; the transition between d-degrees as quantum jumps appearing as uncertainties.

On superposed levels where the 2nd d-degree has been substantiated to material layers, shells (or liquids relative to the chemical phase of solid bodies), 3-dimensional motions can be found for instance as spiralling streams in liquids, discovered in research of turbulence; probably too in currents in the sea and in magma streams in the earth or plasma streams in the sun.

   Cell membranes with their invaginations and evaginations etc. are other, obvious examples as well as the behaviour of membranes during the embryonic development. (See later parts of this work.)

4-dimensional motions in 1st d-degree:
- A "formalistic madness"?
1-dimensional, linear structures are of course very difficult to point out as just structures on an elementary physical level. They should be attributed motions in 4 dimensions, as expansion / contraction, motions in 3 directions, added a motion double-directed outwards / inwards relative to a centre. (Also spiral motions, rotation plus propagation plus growing circumferences outwards, shrinking inwards, can illustrate such a 4-dimensional motion.)

   This means among other things that it should be the distances as 1-dimensional that grow and shrink at the expansion (and eventual contraction of Universe), not the space or vector fields as 4-dimensional in this model. A sophisticated difference !

   Where can we find such motions? We could imagine such a combination of structure and motions as a photographic"negative" to the 4-dimensional vector fields with assumed motion in 1 dimension.

Perhaps gravitational collapses and nova explosions can be analysed in these terms. If the so called "field lines" in vector fields are seen as a reality, not only a help construction, we we could imagine them contracting inwards, - also as factors in the concept of "Mass" (see file Mass - Matter...) - expanding outwards - also as factors in creation of Space.

Magnetic processes in the sun and its protuberances could perhaps be other examples.

With the suggested interpretation of the weak interaction force (see another file) and weak disintegration, it could be possible to connect it with this "1-dimensional structure" and perhaps see its "carrier" in terms of 4-dimensional motions curved into quantified "vector bosons"?

On more substantiated levels we have the pumping of the heart muscle e.g.. The motion is a result of actinium and myosin threads as materialized 1-dimensional "lines" in the "shell" of the muscle, which "expand" / "contract" in relation to one another:
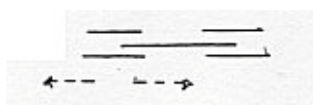
The motion of the single threads seems mostly linear, but myosin is more accurate a double spiral of protein chains with hooks, which attach to actinium and undergo angel changes, so the relative motion of the protein "lines" could possibly fulfil the demand of being 4-dimensional, not only the heart as a whole.

(More about such motions in the booklet "Biology", still only in Swedish.)

The DNA-chains have got several other motions: spiralling and contracting or stretching, turning inside out when copying etc.

Still there are difficulties in our imagination to isolate 1-dimensional structures, and attribute motions in 4 dimensions to them. What about single dimensions as 1-dimensional, used as a bit metaphysical "building stones" in this model? - or some kinds of chemical bonds, perceived as 1-dimensional?

Here we can add that the string theory should include some answers, even if we have postulated in the model here that the same patterns will show up on all superposed levels.

5-dimensional motion in d-degree 0/00:

In the last step in our dimension chain, we have pole 1b as motions from each other, defining a secondary pole 00', and pole 1a as motions towards each other, defining a secondary pole 0'. This implies a pole exchange between outwards and inwards, and together it re-creates a 5-dimensional entity of pure motions: a 5-dimensional motion attributed to 0-dimensional "units".

Two meeting or converging (crossing) path lines define first a new centre, a 0-pole. After passage, when path lines diverge, this 0-pole has been redefined as anti-center, a 00-pole.

In this pole exchange, representing the least thinkable time, we can see **the germ of motion** and we can see this "area" where it occurs as a new complex "point" or centre for development of a new dimension chain.
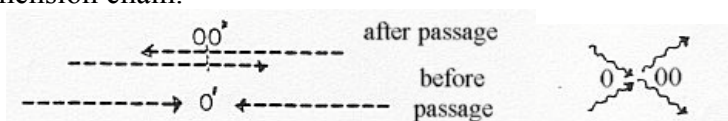
Compare the physicists' detested infinities sometimes appearing in their calculations when they operate with particles as 0-dimensional points?

The 4 motion arrows in d-degree 0/00 would be possible to interpret as translation of d-degree 4, with the pole exchange momentarily redefining the 5th d-degree..

   (Perhaps we also should include the changes and discontinuities as +00/-00 of tangens at 90° in such a view, sine/cosine as 1 / (+/-0) in the coefficient of direction.)

Attraction - Repulsion:
   → ←   ← →

The concepts attraction and repulsion could be used for converging and diverging motions respectively. Observe then that these patterns of motions should be expected as complementary - and only in the 4th degree antiparallel, with the assumed elementary geometries in this model.
   In 3rd d-degree the attraction as motions inwards could be expected taking a circular form, while repulsion motions as outward directed are taking a radial form: an aspect on why planets not fall into the sun or electrons into the atomic nucleus.
   Most orbital path motions (or "Translation") in nature seem to be more or less elliptic. Here we can trace the inward-outward direction of d-degree 4, as a result in d-degree step 4-3. We could connect it with the general view that the poles of lower d-degrees should be interpreted as complex compounds out of the higher d-degree.
   If we go on and accept the hypothesis about angle steps through the dimension chain, the relation between attraction and repulsion in d-degrees 2 - 1 would be more and more parallel (with a difference of only 22,5-11,25° in direction): this could be one way to perceive the p-p-bonds forming atomic nuclei.

Miscellaneous about motion patterns:

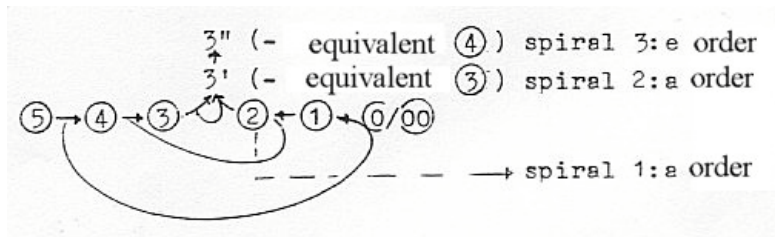**a) Two examples or illustrations** of dimension degrees of motions:
- An air current from a ventilation outlet: linear motion (1), Whirls at the borders of the stream (2), growing whirls in solid angles (3)…
- The driving system of a car: explosion (4), piston movement (1), the rotating rod (2), the gear drive rotation in 2 planes (3)...

b) The growing complexity of path movements:
For material celestial bodies, seen from outside, we have an increasing dimension degree of the path movement, for example in the motion of the Moon around Earth, around Sun, around the Galaxy:
- the own linear movement of the body (1),
- this closed to rotation around a secondary centre (2),
- the spiralled path, seen as relative to a tertiary centre (3),
- spiralling of the spiral path around a forth /quaternary centre…(4)…
The dimension development of the movement could be illustrated with a dimension chain seen perpendicular, in the two opposite directions, with "lost" dimensions meeting "the other way around":

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3" (– equivalent ④)  spiral 3:e order
3' (– equivalent ③)  spiral 2:a order

⑤→④→③⟲②←①←⓪/⓪⓪
                              ──── →  spiral 1:a order
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We can find a similar development of motion e.g. in the rolling up of the DNA spiral to chromosomes:

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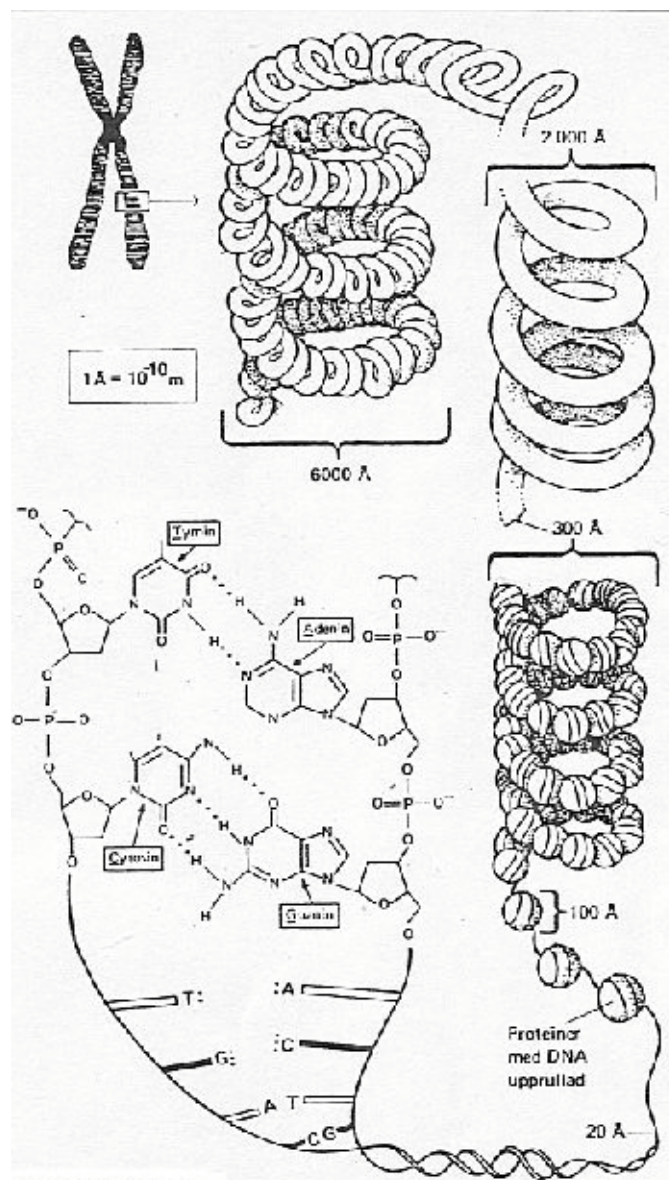
c) Chemical and cyclic processes: Generally speaking we should be able to analyse the pattern of motions as a dimension chain, chemical and cyclic processes as well as cosmic motions.

Counter-direction   Rectification   or   Vibration   Rotation
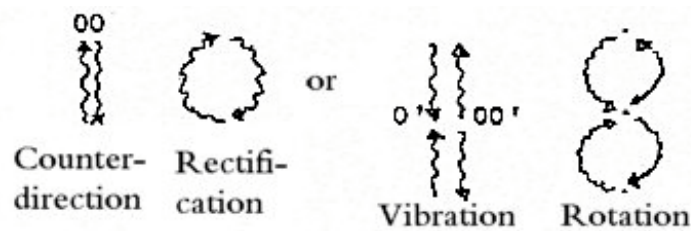
Movements towards / from each other could give a basis for cyclic processes through pole exchanges as change of path and change of direction:

Motion in d-degree 4 as 1-dimensional, linear, translated to 2-dimensional movement in d-degree 3: a combination of the motion moments of both poles.

A rotation movement is then a composition of 2 half-turns. Original 0-pole and 00-pole (anti-centre) give the basis for elliptic rotation.

Pole exchange, path change, increasing one-way direction, direction change, polarizing (parting), combination, inversion - all become aspects on or key words for the changeover from linear to rotational movement in the step 4 → 3 of the structure chain. As well as "the other way around", via 00, anti-centre.

d) Motions as building workers, motion patterns gradually substantiated:
An aspect from the end of the dimension chain would also be possible: motions as primary phenomena, gradually substantiated:

On the biological level we have embryonic blood islands as "points" which join to blood "lines" or ways which then form blood vessels, 2-dimensional tubes, which later get partly curved as through counterdirected blood streams, forming a tube heart, a centre which then will develop to a 2-3-4-room heart. And tubule in the cell plasma of nerve fibres could be interpreted as substantiated chemical rotation superposed a chemical path propagation movement?

e) Energy aspects:
Does it exist something like pure kinetic energy ? Without a carrying mass? Obviously even massless quanta as the "carriers of forces" like the bosons represent energy. (And neutrinos for instance has been said to be mostly kinetic energy. It's still uncertain if they have any mass.)

A body, once set in motion, will in empty space, without friction, continuously go on with the same velocity and this motion, if following a straight line, doesn't represent any energy according to Newton. No force is needed to uphold it. But are there any straight line motions in Universe for celestial bodies? And if so, at least the first action which sets them in motion represent energy which is carried on with the body, with its "linear momentum", depending on the velocity.

With curved path lines it is another thing, To explain them, a force is demanded according to this classical physics. That is gravitation.

But how if the curved motions of planets and stars are interpreted as the border line between +/- E, between the fields of inwards and outwards acceleration forces, as it appears in d-degree 3: an "E0-line" between complementary forms of energy or forces. Compare Einstein's curved space and bent path lines as the nearest distances in this space in the neighbourhood of attracting fields.

In the model here we have identified the inward directed vector field in d-degree 4 with so called gravitation, and assumed that Mass (versus Vacant Space) in d-degree 3 is a result of inward directed or negative acceleration. We have assumed that the fields

of vacant space and masses together forms a curved, non Euclidian structure in d-degree 3, according to the hypothesis about angle steps.

Then d-degree 4 as double-directed binding force underlying structures in d-degree 3 would still be regarded as a force. At least half of this force would represent gravitation, even if the space is already curved and the "lost" d-degree is translated to motion: rotating motions along "E0"-lines. It seems difficult to totally replace gravitation with the curved space.

See some comments to Einstein and about d-degree step 4-3
See further about Temperature - some notes, Velocity, Time - a few notes.

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