# Dark Matter, Dark Energy and
Other Cosmological Considerations

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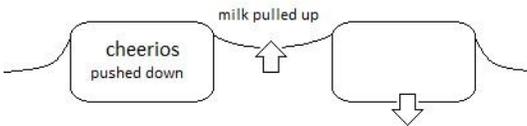X @el_beaubien
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Abstract

There is a simple solution to the dark matter problem that is not being discussed. It is the *"tension"* of space. This is what the fine structure constant measures … (the *"springiness of space"*- Dirac). If true, the proposal also gives the solution to the dark energy problem as well by relegating it to an alternate measurement point of view. The lessening tension (diminishing FSC) slows the speed of light and renders a reasonable solution. No new particles are needed, and no modification of the Newtonian equation for gravity is necessary.

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In this model there are only two types of fields: an absolute reference frame (the α-field) and a growing number of spherical reference frames (β-fields) reflecting the baryon number as outlined here (viXra:2507.0220). The 3D Euclidean frame intrinsically has no tension but acquires *"unit tension"* with the addition of the spherical reference frames that interact with it thereby giving to it the ability to transmit a wave.
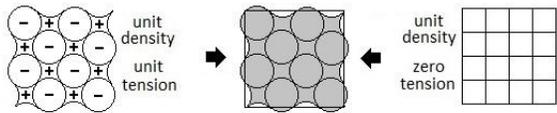

As the universe ages, the tension asymptotically approaches "*zero*" due to the clumping of matter by the gravitational interaction … analogous to Cheerios in a bowl of milk. By capillary action, milk is pulled up the sides of the Cheerios and by reaction, the Cheerios are pulled down into the milk. The overall level of milk in the bowl is raised, just as the level of water in a tub is raised when a beach ball is pushed down into it.

The surface tension of the milk is increased like a rope hanging between two poles. If the rope sags and the poles move toward each other, or if the rope and pole distance is shorter ... the tension in the rope decreases.
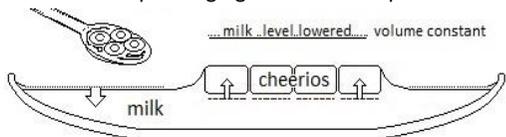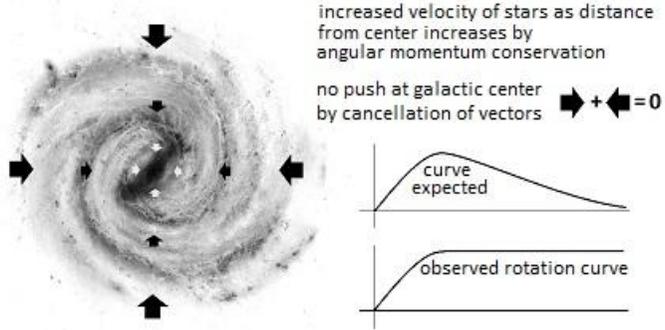

In like manner, the surface tension is lessoned if the Cheerios "*clump*" and the level of the milk goes down, which supplies the energy by lowering the overall mass down the earth's gravitational field gradient.

Here is a simple pictorial proof of the lowered surface tension by means of clumping the cheerios. The line is the milk surface level.
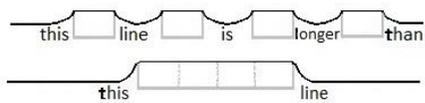
The velocity of light is determined by the tension of the α-field, just as the velocity of a wave on a string is determined by the tension of the string. At the beginning of time, there is a uniform distribution of matter, and we define light velocity as "*unit velocity*". After any finite time, light speed will be reduced as matter clumps (by gravity) resulting in the lessening of α-field tension.

In addition to the gravitational interaction already given (viXra: 2507.0161), there is then a "*gravitational concomitant*" (another force) that pushes matter into clumps, and accounts for the excessive velocities of stars in spiral galaxies via angular momentum conservation.

increased velocity of stars as distance from center increases by angular momentum conservation

no push at galactic center by cancellation of vectors ➡ + ⬅ = 0

curve expected

observed rotation curve

The gravitational concomitant will also cause galaxies in clusters to seemingly violate the "*virial theorem*", by adiabatic compression which causes velocities to exceed expectation.

here faster HOT

COLD slower velocity here
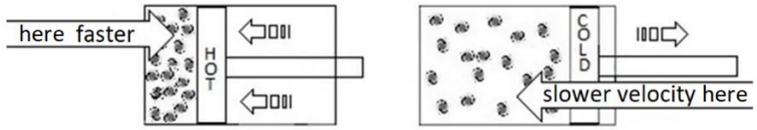
"*Dark energy*" is explained as the result of a gradual lessening of light speed in the Hubble equation. We can account for the observed phenomena by either increasing the Hubble constant … or … decreasing the velocity of light.

$$\text{more} \Rightarrow \frac{C_{\text{speed of light}}}{H_{\text{Hubble constant}}} = \underset{\substack{\text{radius of universe} \\ \text{in megaparsecs}}}{\overset{less}{n}} = \frac{C_{\text{speed of light}} \Leftarrow less}{H_{\text{Hubble constant}}}$$

Dark Matter & The Bullet Cluster

This observation is troublesome because it appears to solidly underwrite the idea of dark matter being … some form of real particle … whereas it is not found by any experiment to date. Though ever more sophisticated experiments are devised, nothing is found. This indicates (and historical scientific precedent evidences) that there is … **NO DARK MATTER**.

The problem:

Two clusters of galaxies have collided and passed through one another. The galaxies themselves are not disrupted … as expected … due to their being small volumes in the large cluster space. However, the hydrogen gas permeating the cluster space cannot *"bull"* its way through the collision (like the galaxies) … because the probability of each atom of inter-cluster gas in one cluster passing through the other cluster gas … is vanishingly small.

Cluster   Gas   Cluster

A   B   C
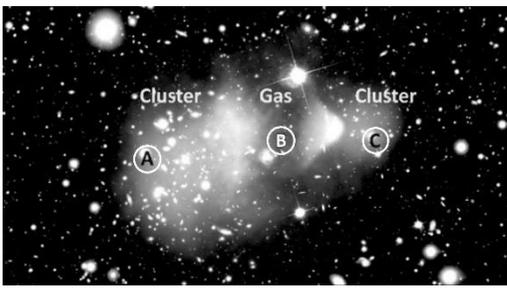
Note: It is true that a lone hydrogen atom cannot make it through millions of light years of the opposite moving gas without collision (verified by redoing calculation).

Consequently … virtually all the inter-cluster gas is stripped from the clusters at the point of collision. This collision produces detectable radiation (as observed in astronomical pictures).

Because the inter-cluster gas is measured to be a much greater mass than the galaxies themselves, it must be conjectured that dark matter (associated with and attending all gravitationally bound matter) … should accompany and remain with the colliding gas cloud … it being the greater mass of *"normal"* matter.

However, gravitational lensing measurements show that dark matter moves through the cloud … eschewing collision there (collision being an electromagnetic phenomenon not *"felt"* by the putative dark matter). The Bullet Cluster then serves to strain out dark matter associated with the inter-cluster gas and pass it on through with the galaxies themselves. In the picture dark matter is at A & C … but none at B. Hence, we are seemingly forced to assume a particulate nature to dark matter rather than a modification of the Newtonian gravity model (MOND).

It may be that neither of the above is the case. **THERE IS ANOTHER ALTERNATIVE**. It is the *"qualitative difference"* between the inter-cluster gas and the galaxies themselves.

The matter in the gas is *"diffuse"*. The matter in the galaxies is *"clumped"*.

By this theory of dark matter … the tension gradient is more pronounced when a mass is clumped than when diffuse. In this theory … matter is *"pushed"* by empty space rather than *"pulled"* by gravitational bulk material (of any kind). The source of the push is a *"tension gradient"* in space very similar in effect to the bowl of Cheerios analogy. When few Cheerios remain in the bowl … they *"clump"* and in so doing reduce the overall surface tension of the milk (aka. space) between the O's. The energy source being that by clumping, the center of mass of the milk & O's is lowered (ever so slightly) in the earth's gravitational field.

Here, the fine structure constant (the measure of the conjectured tension and determinate of light velocity) … is lower in the vicinity of *"clumped mass"* than in very large empty voids … thereby producing the proposed gradient. The gradient pushes matter toward an existing clump, producing excessive stellar velocities in spiral arm galaxies (Rubin) due to angular momentum conservation … and virial theorem violations by adiabatic compression in galactic clusters (Zwicky). No particulate matter is necessary, and no modification of Newton is required. We simply need to affix another determining equation to the other force calculations.

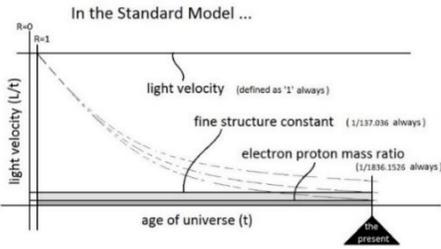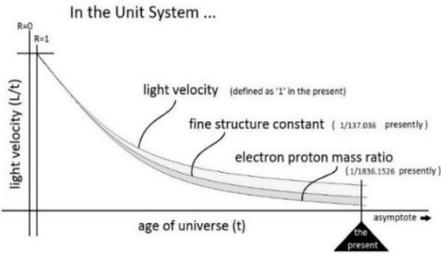## The Strength of the Electric Field

The attraction and repulsion strength of electric fields (1/137.036) is maintained near to the strength of the nuclear force (1) through the compression of its positive and negative fields by the gravitational force.

We can imagine that all positive charges are removed. Then, all electrons will disperse explosively into space until achieving uniform distribution. The conjecture here is that electrons brought together by gravity constitute a "*spring*" under compression. Because positive charges cancel the negative, gravity is enabled to do the compression of both simultaneously. This constitutes the formation of an energy potential, constructed from the lost mass of the fundamental baryon mass from 1 unit mass down to $1/(2\pi R)^{1/2}$. Thus, what the gravitational force loses, the electrostatic force gains maintaining a disparity of strength between the two.

A changing set of constants from an initial '1' down to 1/137 and 10^{-39} allows for the rapid accumulation of matter into galactic sized clumps much sooner. Rotating black holes formed early on will contain a disk of matter within its event horizon tending toward a toroidal shape so that … as the gravitational interaction weakens much faster than the electromagnetic … at some point the event horizon will lower into the body of the black hole releasing the bulk of its stored contents out at the poles. This is conjectured to be the cause of many quasars early in the history of the universe but not so many now when the rate of change of "G" is much slower.

Because the strength of the electromagnetic interaction is governed by 1/137 … and … change in the FSC is a function of clumping … the *"Hubble Tension"* problem would be ascribed to the two different computational approaches. One is from the initial *"Big Bang"* and the other is from the point where the clumping of matter begins … when the electromagnetic interaction decouples from gravity. The 'fine structure constant' remains at unit strength until the clumping begins.

In the model presented here, all the physics constants are changing, having initial values of just 1. In the exaggerated graph we see that if we define the present value of 'c' as one unit, its initial value must have been greater than 'one', embodying the requirement that 'c' decrease over time.

In the Standard Model, a much simpler graph gives these constants as true constants over the entire history of the universe, at the logical expense of picking these universal numbers *"out of a hat"* at random … offloading the explanation to the *"many worlds hypothesis"* where all values abound (somewhere).

If these models are logically equivalent ... that is, if expanding space is the logical inverse of shrinking baryons, and if the *changing* expansion rate in the standard model (*"dark energy"*) is equivalent to the slowing of light ... as required in the model presented here ... then ... any potential differences must logically cancel out to yield the same observables.

We can estimate the difference in the radius of the universe when the slowing of light velocity is factored in, by taking the definite integral of the calculated radius, when that radius is given as the age of the universe.

That is, if we were assuming that both the unit length and unit time were unchanging, then the number giving the radius of the universe is also its age. 10^{26} unit lengths would mean that the universe was 10^{26} time units old using the unit scale.

Putting the velocity of light on the y axis and the age of the universe on the x axis, the total area under the curve 'Q' then represents a length, which will be the revised radius of the universe, when compared with the area 'M' from a constant light velocity.

Then Q+M divided by M is the ratio of the revised increased radius, to a possible standard radius, which increases only linearly.

Because the present velocity of light is defined as 1 unit, the initial velocity must be defined as greater than 1 unit.

If we take Dirac's opinion that the fine structure constant is the measure of the springiness of space in the present unit system, it is the measure of the tension in the α-field … and ... that tension is the controlling factor in the velocity of light. Thus, since a decreasing 'fine structure constant' denotes the slowing of light velocity ... a greater fine structure constant in the past denotes a higher light velocity. And if we call the present velocity of light ... unit velocity ... then the beginning light velocity should be ~137 times greater than now. Alpha (α) varies (approximately) inversely as the twelfth root of R, with a small constant factor composed of mathematical and geometric numbers … [This depends on the form of the hydrogen ground state equation, and whether we make that force numerically equal to the square root of the Planck constant, or the reduced Planck constant and compute the age of the universe from the force between electron and proton in the ground state]. (viXra:2506.0131 e/P fsc calculation).

$$R = 1 / [2/3^{4/3} \times (\alpha_{revised})^{12}] = 7.527 \times 10^{25}$$
$$[7.527 \times 10^{25}]^{1/12} = 143.346$$

We divide the inverse fine structure constant (which has been modified here with the appropriate mathematicals) by the twelfth root of the age of the universe. This gives us the measure of 'c' at any radius such that at the beginning of the universe, it is 143.346 times greater than now. While at the present time we get unit velocity as required by theory.

$$\int_{1}^{n \times 10^{25}} \frac{143.34}{t^{\frac{1}{12}}} \, dt = R_{revised}$$

Taking the appropriate definite integral for the calculated radius gives an increased radius on the order of 10 percent greater ... meaning that the calculated distance to a type 1a supernovae would be greater than expected.

Note that because the speed of light varies as the inverse twelfth root of the Hubble radius, when the universe is one trillion times older than it is today ... the fine structure constant will be about the inverse twelfth root of 10^{38} or about 1/1467 instead of 1/137, which is only about ten times

Definite integral   [Calculate]   Welcome to OnSolver.com

Input the variable of integration: x   (from a to z)
Select the lower limit of integration: Type in by yourself
Select the upper limit of integration: Type in by yourself

$$\int_{1}^{7.527757 \cdot 10^{25}} \frac{143.3472}{\sqrt[12]{x}} \, dx = 82\,121\,063\,929\,329\,931\,039\,801\,344$$

Enter the function to integrate:

7.527757·10²⁵

$$\int \frac{143.3472}{x^{\frac{1}{12}}} \, dx$$

$$\int \frac{143.3472}{\sqrt[12]{x}} \, dx = 156.379 \, x^{11/12} + \text{constant}$$

1

$$\frac{8.21210639 \times 10^{25}}{7.527757 \times 10^{25}}$$

identity function if 'c' was unchanging

$$\int_{1}^{7.527757 \cdot 10^{25}} \frac{x}{x} \, dx = 75\,277\,570\,000\,000\,091\,221\,393\,408$$

$$= 1.09091$$

smaller. And the speed of light will be also about ten times slower. Anyone, at any time in the development of the universe, who calculates the initial velocity of light, will generate a different number when they consider their present light velocity as unit velocity.

And … matter cannot clump at the outset even though the strength of the gravitational interaction is initially equal to the electromagnetic interaction, because it must first "*decouple*" itself from the interference generated by the electromagnetic radiation. That interference results from there being no room to sequester the energy from a falling gravitational potential. "*Making room*" is a question of the universe expanding (or in the case of this model) of matter shrinking. "*Six of one, half dozen of the other.*"

LIGO Gravitational Waves

The LIGO experiments have to date produced many detections of gravitational waves. These waves are reasonably measured to be transmitted at the speed of light, proven by two detectors registering the same signal, in a time separation proportional to the time needed for light to traverse that distance.

The model presented here gives the speed of gravity as 10^{39} times faster than light. The difference originates in the gravitational concomitant, which is the solution to the dark matter, dark energy problem. By the present theory, the waves measured by LIGO are alterations in the tension of α-field lines which, in turn, cause the velocity of light to vary. The Euclidean field designated as the α-field has transmission velocity 'c'. LIGO results are therefore conjectured to be non-electromagnetic changes of the α-field, due to the rapid periodic accelerations of large neutral masses.

The initial unit density of the α-field is always conserved. Positive and negative charges are here theorized to represent alterations of density in the α-field and therefore, because density is conserved, charges must exactly cancel. The acceleration of a charge produces a photon of velocity 'c'. Light is then principally, a traveling "*density artifact*" of the α-field. What Ligo experiments detect is then a "*tension artifact*" of the α-field also traveling at velocity 'c'.
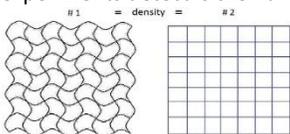
#1   = density =   #2

The figure shown demonstrates that the field density and tension parameters are geometrically separable. The gravitational concomitant must then produce a 'tension' wave rather than a 'density' wave.

By the theory presented here, tension waves emanating from massive bodies, in the orbits that generate them, must alternately increase then decrease the tension in the α-field through which they pass.

The overall average tension throughout the universe is now less than the initial unit tension due to the clumping of matter, conjectured to be quantified by the fine structure constant. There must exist then, by this model, a tension gradient between large concentrations of matter and open spaces, such that a measurement of the fine structure constant within a galaxy would yield a slightly lesser number corresponding to a lesser light velocity, and a greater FSC in one of the great voids away from galaxies. There is then a net push of matter toward increasing concentrations of matter, generally in line with the standard gravitational attraction, resulting in excessive velocities of galaxies within clusters, inconsistent with the virial theorem ... as well as the anomalous velocity distribution of stars in spiral galaxies.

The alternating tension gradient caused by the rapid orbital rotation of two massive bodies ... in the orbital plane, containing a line drawn from the detectors to the rotating bodies'
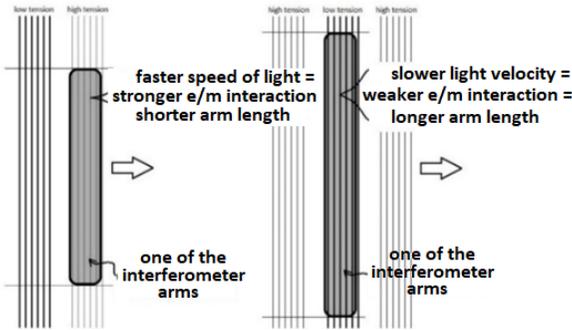
barycenter ... then alters the α-field tension to an extent which is now detectable by experiment. In the LIGO detected supposed gravitational wave, field lines will be alternately tightened then relaxed.

The speed of light within the wave is thus slightly altered, faster, then slower, and that difference is detectable by interferometry, provided that there is some asymmetry in the wave arrival time in each arm of the interferometer.

Here, we are asserting, as an alternative, that the speed of light in the interferometer arms changes, combined with a length change in the arms, caused by intermittently altering the strength of the electromagnetic force. From theory, the rate at which changes in a local gravitational field are sent to distant observers, remains at 10^{39} times light velocity, which is the present transmission velocity of information in the β-field.

What is detected by LIGO is the concomitant form of gravity caused by the primary clumping of matter ... that secondarily affects the α-field tension ... changes of which are transmitted at the speed of light. The overall cumulative weakened tension is also the solution to the dark energy problem, by way of decreasing the velocity of light in the overall α-field over billions of years, as previously given.

The LIGO measured gravitational wave then represents the transmission of some energy in the α-field due to matter clumping, to other places where it does 'work'. The overall universal decrease in α-field tension is converted into the kinetic energy of faster moving galaxies in galactic clusters and faster moving stars on the outskirts of galactic disks.

Conclusion

All the foregoing (concerning the tension gradient) is the identity of General Relativity, i.e. its equal replacement. The slowing of light replaces *"space-time"* as its equivalent. Gravity creates its own concomitant 'force' as a *"byproduct"* … acting generally in the same direction.

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