Acceleration Space with Applications to Cosmography, Cosmic Inflation, and the Subduction of Proper Space

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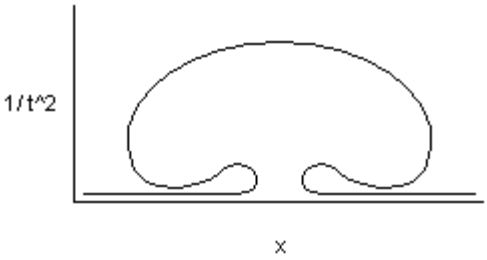
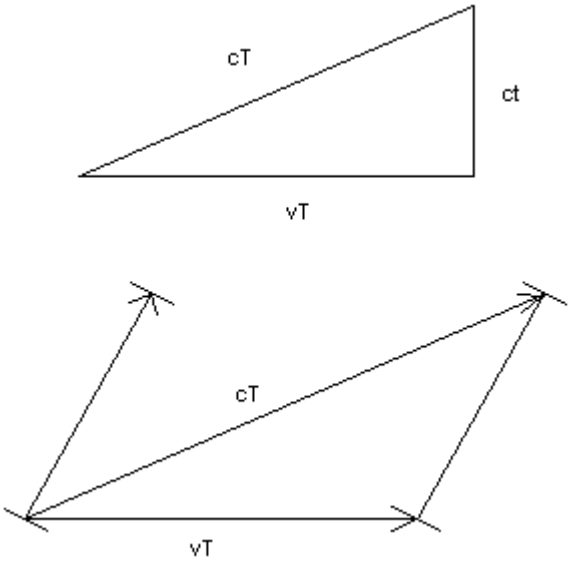
Abstract
A proposal for the graphical representation of gravitational curvature, application of a new time-dilation factor, the equivalence of refraction, gravity, electromagnetic radiation, the notion of proper space, and the combination of velocity and gravitational time-dilation.

With respect to gravitational curvature, such a graphic can be created, as exemplified in the following figure with one-spatial dimension.
fig1

A container of anti-gravitating matter is compressed inside ordinarily-gravitating matter.
fig2





An acceleration field is more fundamental and invariant than a force field, in that all particles at a certain radius will experience the same acceleration towards that object. Even reactive or repulsive proper acceleration is atomic repulsion and attraction. Time dilation must not depend on any proper-coordinate distinction. What would be needed for a decomposition of time dilation into vector components is to realize that the relativistic triangle needs to be extended to cases beyond right triangles.
fig3

$$-\cos(\angle(cT, vT))\cdot 2\cdot cT\cdot vT+(cT)^2+(vT)^2=(ct)^2$$

By expressing the acceleration magnitude at any point X as $Y\,m^2=\frac{1\,lm}{X}$, we create an inversely proportional factor of area, which can be used to define a curvature arc-area at a corresponding point in a transformed *acceleration space*. In the *walk space*, vectors are projected along the perpendicular lines of acceleration vectors, perhaps with an added spiraling angle, to create a mesh of triangles, for the acceleration magnitudes for the corresponding areas of the mesh of triangles in the acceleration space. There are several methods to map an infinite domain to a finite domain, to avoid an infinite area size at

a point of zero acceleration. There is $Y=\frac{1}{X+X_{max}}$, the simplest method, or $Y=\frac{2X}{1+X^2}$, the method of relativistic velocity addition, $\tan(Y)=X$, the method of the Penrose diagram, or additionally, there are $Y=\frac{(X^2\cdot sgn(x))}{(X^2+2)}$, $Y=\frac{(|x|\cdot sgn(x))}{(|x|+1)}$, $Y=\frac{(|x^2|\cdot sgn(x))}{(|x^2|+1)}$, and $Y=(|x^3|\cdot sgn(x))/(|x^3|+1)$, which take into count both positive and negative X .

There are many spaces which can be created, but the only invariant ones that do not depend on any property of the test particle are the gravitational acceleration space, the electric charge space, and the inverse electric acceleration space using the masses and charges of the available particles, and a test charge and mass. A negative area or anti-gravity can also be expressed as a twisting of the neighbor lines as a result of a cross product, or as with pointing arrows.

A mass energy space may be derived using 1.) the time it takes to accelerate to light speed, $E=\int_{D_{initial}}^{d'}\frac{G\,M\,m}{(D_{initial}-x)^2}dx$, where $c=\int_0^{t_{ramp}}\frac{G\,M}{(D-x(t))^2}dt$, $d=\int_0^{t_{ramp}}\int_0^{t_{ramp}}\frac{G\,M}{(D-x(t))^2}dt\,dt$, and $d'=D-d$., 2.) the gravitational potential energy $E=M\,G\,h$, or 3.) given the energy $E=\int_{D_{initial}}^{d}\frac{G\,M\,m}{(D_{initial}-x)^2}dx$ for a distance d that would be traversed by light, in the speed affected by gravity at every point along the way toward M , given the time t it would take to get to the center, or half-way, and the distance d then being the distance that a light unaffected by gravity would travel in the same interval t , or 4.) how much time t it would take for mass m to accelerate to light speed, and given the amount of time t that would take, how much distance light would cover, if affected, and if not affected, by gravity source M .

Amplitude space of electromagnetic radiation, using the wavefront normals as directions, and amplitudes as magnitudes, or frequency or wavelength space with the frequency or wavelength as the magnitude, can analogously be created. In addition to walking the perpendicular lines along the acceleration direction vectors, to create connected sheets of triangles from equally spaced starting points in the walk space, isoline contours can also be used, to a different effect, for the walk-space sheets. One final space that can be created is that path space, where the entire walk space is transformed around the resulting geodesic of a test particle, resulting in a continuously straight and non-changing velocity for the test particle in the transformed space. The unification of curvatures of electricity and gravity then needs a conversion between the invariant values of gravitational acceleration and electric charge and vice versa, possibly using Coulomb's, with a meaningful combination of their properties, without using any additional, artificial dimensions.

The cosine equation simplifies to a simpler equation in the case of one direction.

$$\frac{t}{T}=\frac{c-v}{c}$$

There are six gamma factors in total then: $\uparrow\gamma_x$, $\downarrow\gamma_x$, $\uparrow\gamma_y$, $\downarrow\gamma_y$, $\uparrow\gamma_z$, and $\downarrow\gamma_z$. The effective velocity and acceleration thus get scaled accordingly.

$$\uparrow v_x'=\uparrow v_x\gamma+\uparrow a_x\gamma$$

A particle can be thought to take more time, or be length-contracted, and thus experience a farther distance in one direction, in the same way.

fig4

There are then six different ways of looking at the case of the triangle, from perspective one or two, and using time, velocity, or distance. In the case of acceleration backward, or repulsion backward, the same backward-gamma factor is used. The direction of the gamma factor depends only on the equivalent direction of light, not the relation in space or the velocity. Atoms thus don't get heavier as they move faster, but effectively feel a stronger force on their back.

Gravitational lensing and refraction are one. Light also slows down in a gravitational field, and we must ask, what is it that refracts the light but the empty spaces between particles, which are the gravitational and/or electric forces, through a more dense medium. We know that gravitational lensing happens because of the 1919 experiment, because black holes trap light, and because all of refraction may now be seen to be the effect of gravitational lensing. Electric forces also have an effect on light like gravity, through the Faraday effect, and may perhaps be derived similarly.

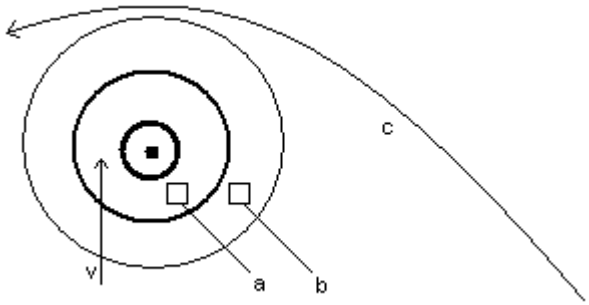


fig5

Light and gravity are also one. Gravity is not a positive thing, but the absence of various spectra light causing a push, a la Le Sage's theory of gravitational ether, with diffraction and blocking by other objects, causing a net lack of push from that object's shadow, and thus attraction. And thusly gravity is a wave, which makes sense for it to gravitate from black holes, and not exceed the speed of light, the information speed limit. And the combined effect of "gravity", i.e., absence of various spectra light, causing a refraction of other light passing there, can be worked out later during implementation of a demo app, and working out the details. There's a lot more wavelengths of light then we can actually measure or know about and an electron only has to be in a certain low velocity and some acceleration for instant to generate very long wavelength wave segment, Or maybe a very tiny wavelength wave segment or wave, which may be more energetic than gamma rays. All the wavelengths together might create the effect of gravity waves. Light doesn't have the same distribution as, e.g., gamma background radiation, which appears from almost every direction, even where there are no stars visible there, which indicates that other wavelength electromagnetic radiation, i.e. gravity waves, might be emanating from everywhere, except, as should be the case, where there's cover from gravitating bodies. It might not be electromagnetic waves exactly, but the principle would be the same and analogous to Le Sage's mechanism, but with an unknown source.

Light particle and wave theory are also united, in the concept of the photon-link, and the creation of more linked photons as they pass farther. The distribution is such that there are as many photons created as there would be if the wave was propagating and diffracting and refracting in place of the particles. Absorption by eg a metal mesh used in a radio telescope, absorbs a photon of radiowave-wavelength in radius, and leaves a slight emission passing through the mesh through the holes, in accordance with proportions in Snell's laws. The linked neighbor photons in a longitudinal wave segment, effect each other, in that any obstruction effects the movement and distribution of future photons. A single absorbing particle may be seen to be a diffraction slit, where the size of the opening, is seen to be the arc-length along the longitudinal wave segment, around the point-size particle, and

appropriate amplitude absorption and diffraction and refraction direction, in accordance with Snell's laws.

Circularly polarized light for the Faraday effect is simply the emanating spherical waves vertically of a rotating electron, along the normal of the plane of rotation, and the actual wave phase is determined by the orbital phase, creating a spiraling wave. Any moment, regardless if there is movement or deceleration, creates a spherical radiation, with a phase and amplitude component, determined by the emitting electron's velocity and acceleration. The actual sine-wave phase will appear to be a spiral on the plane of orbit. The phase component of the radiating spherical wave depends on the direction of velocity and acceleration, which means that a vector must be stored, such that there is a different phase at any single point along the spherical wave segment.

Frequency and amplitude are both energy, and the difference is a matter of the number of crests per time, as opposed to, the number of crests per time. Frequency means more crests and troughs per time, while amplitude can mean the firing of several crests in unison, but different distribution, than that of such a frequency of emission. Overall, a certain frequency is required to work with the orbital mechanics of a certain electron, to eject it from a nucleus. And perhaps not all frequencies are absorbed exactly. The red-shift and blue-shift in stars is the same as the mechanism of light color emitted by electrons in materials, experiencing acceleration or deceleration during movement.

There is no movement, but only the creation and destruction of proper space, or the subduction and inflation of proper space. Proper space also combines the velocity and gravitational dilation into one velocity dilation, and might explain velocity dilation itself as a phenomenon of this subduction of proper space and cosmic inflation. It corresponds with the concept of *extra* space causing gravitational refraction and causing light to travel slower when passing through more proper space, closer to gravitating bodies, and having light curve inward on the side with more proper space. Gravity engulfs thusly not just the matter around it, but the actual proper space around it, to which the particles are attached to and subducted in. It can be visualized graphically as dots on a piece of paper, where each dot is being scrunched and engulfed in a point, while new paper is being created. This is necessary to explain the fact that for an object to be standing still in proper space, and thus not experience length-contraction, it must be falling in at free fall speed or at escape velocity at that radius, which is the same considering a particle accelerated from rest at an infinite distance away. To stand coordinately-still, is to properly-move and experience length-contraction, against the natural curvature of space-time. And this may be together combined with frame-dragging effects. The offset of position increases at a square rate, in accordance with the effect of acceleration, which is the amount of surface area of the proper space compressed along a wedge. Perhaps all particles acting as attractors act as subductors of proper space, and the effect of collision, may be explained by the subduction of these subduction points. Cosmic inflation is not a coordinate expansion, as is normally said, but a proper expansion, of proper space. Though cosmic inflation can be a coordinate *and* proper expansion, it is not always coordinate, but *is* always proper, expansion.

Gravitational time dilation and velocity time dilation may be combined by multiplying the factors together, or considering the extra space being traversed at the coordinate velocity, resulting in a bigger proper velocity, and thus a bigger gamma factor. Also, by adding the escape velocity vector due to gravity to the actual movement velocity, giving a sideways and vertical length-contraction, and length-expansion part, they may also be combined. The symmetry of a back- and front- dilation or contraction factor on all axes solves all the paradoxes of relativity, including the bug-rivet paradox, the twins paradox, and the barn-pole paradox. The direction of velocity and gravity may also have to be considered, together, for both length-contraction, time-dilation, and the refractive effect. Also, in the

effect of gravitational red shift, i.e., where stars with higher gravity will appear to shine more in the red spectrum of light, as if they're moving away, can be explained by the fact that gravitational and velocity dilation are one, and it is the proper space being subducted in the star, causing the wavelength of the emitted light to be stretched out into the red.

fig6

A new kind of graphical projection can be created using gravitational lensing. It is perhaps already present in our experience of distant vistas and perhaps a slight effect astronauts experience from space.