

## A PROPOSAL ON SPACIAL DYNAMICS

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The following is a study of gravity space. As a fan of GR I have tried to extend it to a deeper understanding of the fundamental relationship between mass and space-time. I had questions; how does GR gravity accelerate mass? How does mass affect space from a mechanical point of view? Why does GR appear to violate E-conservation when local and global fields merge? Why does it fail to predict galactic rotation curve anomalies? Is dark matter necessary? Where does all the energy come from that powers gravity? Why is space expanding? Can dark energy be understood? What the hell is space???

These were difficult questions so a proposal had to be devised that followed GRs past successes and current observations. Time and space had to be linked together with mass. Dividing space into discreet volumes and putting them in motion solved some questions on converging fields without violating Energy conservation and seemed a logical place to start but this lead to a simple looking device with far reaching implications that are way beyond this paper. So in the following we shall construct a proposal that answers the above questions on gravity space alone without infinities or singularities and keeps most of the action in plain view of our 3 dimensional universe and as a bonus lets make the clock tick and take a short look at how particles assume mass.

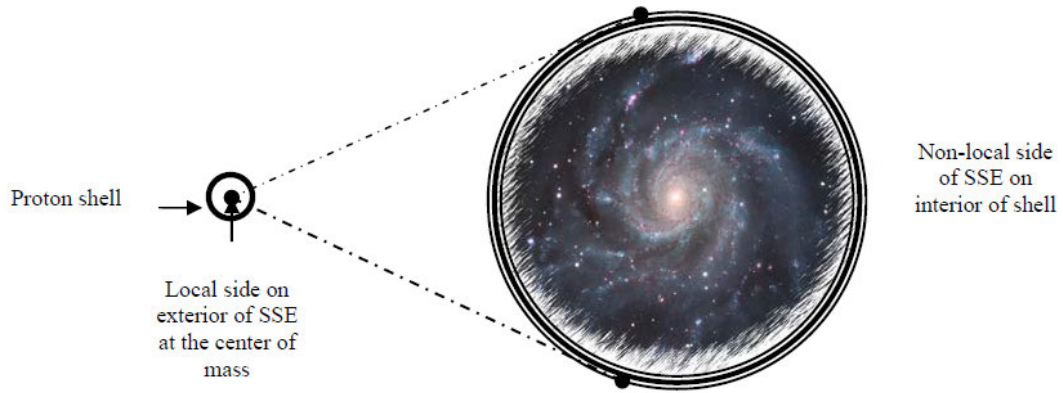
How can space move mass if space itself is not moving? If space is curving in it contracts and expands. As this occurs the space is moving and it must be moving, shrinking or collapsing toward the local mass. It just seems logical. But how do you set space in motion and allow for expansion and contraction without an infinite supply of space?

MASS

First let's look at connecting mass to space. In GR mass moving through space causes the space to move and distort. Mass also imparts gravity energy in some way. How does the mass reach distant space and have an effect faster than C?

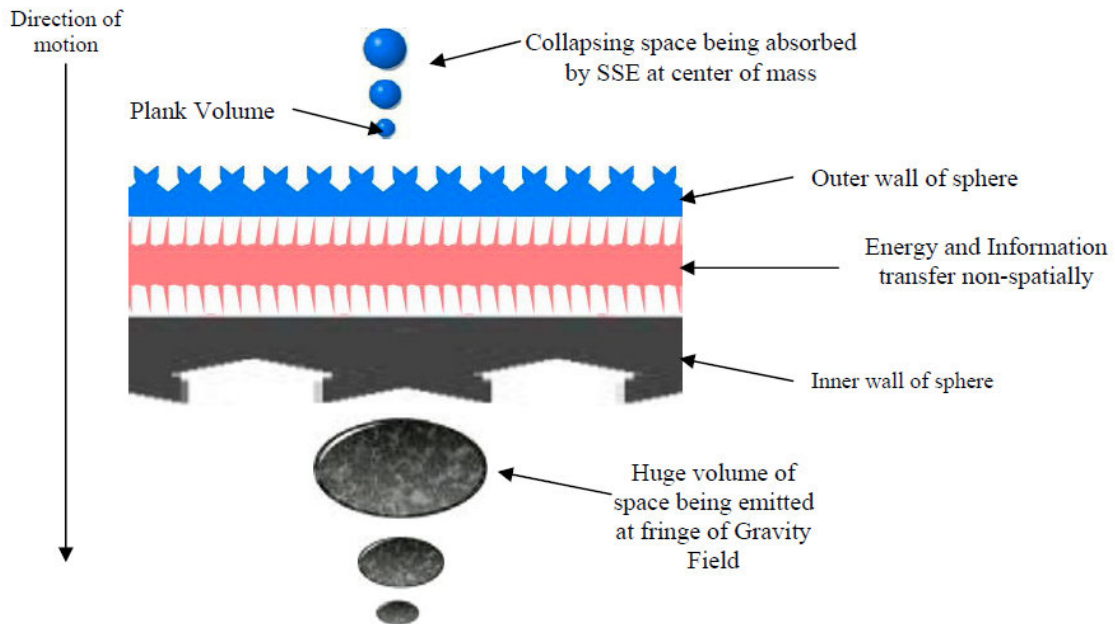
All massive particles contain a Space Sink Emitter at the center of gravity. See fig. 1 The SSE is a tiny sphere that absorbs space on the outside surface and emits space on the inside surface. The outer surface is local to the particle and located at the center of mass but the inner surface emits out at the fringe of the gravitational field. It is as if the SSE has 2 volumes at the same time. The local volume is at Plank scale and the inner fringe volume is galactic because the sphere wall is non spacial. It transfers energy and information of Gravitational space fields only but does this without moving anything across space.

Fig. 1



Are we now seeing the SSE as larger on the inside then the outer side? It may appear so but this is not the case. Spatial location is information carried within the wall of the SSE creating the distance and location on a virtual grid. The SSE wall is non-spacial and does not exist in the space it emits. It seems to exist everywhere and nowhere at the same time. A transfer of energy and information occurs from location to location via the SSE. The wall of the SSE is within our dimension from 2 different sides so it appears 2 dimensional but the energy transfer in between is a space less dimension. See fig2.

Fig. 2



We just have to get over the fact that gravity space is not a background. Every particle of mass emits its own spacial field and each field is finite. There is no background. Both the large and small are recycled from a sphere that's both tiny and huge. How does this relate to BHs?

When massive particles are pressed together hard enough the particle identity space and it's fields are lost to expanding space but the gravitational energy remains and the small SSE spheres merge to make a larger single SSE sphere. This becomes the horizon and expands with added mass. Also a Black Holes SSE oscillates as a single particle. Now for the spacial properties.

### SPACE

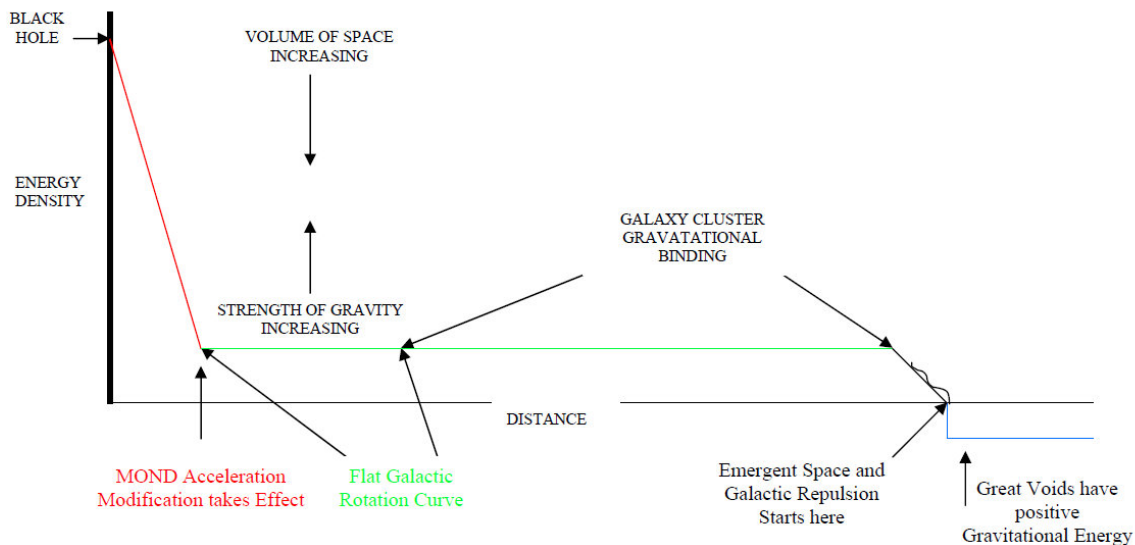
What is space? Why is it dynamic? Where does it come from? Does it have energy and if so where does it get it? Is it continuous or in pieces? How does it separate objects? Wow these are tough questions to answer!!

To answer this we must look at space as a much larger player in mechanical physics.

First there is more then one kind of space. The local space we occupy is mostly made of Gravitational space. Particle Space is what we measure and weigh. Fields and waves are space projected from particles. Expanding space is in the voids.

The particle we know as a proton emits many kinds of space such as the space the proton occupies, the space that charge occupies, the space of the local gravity field and many more from the standard model. The space we are most concerned with here is Gravitational space. The following graph illustrates the 3 properties of gravity space.

### Distance from Mass Showing Energy Density and Unit Volume

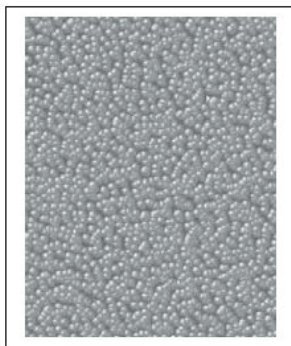


The Energy density line represents contact with the mass. The top is where gravity fields are strongest. The bottom at the distance line is where the gravitational field energy is 0. At the point of the Black Hole space volume is the smallest but the energy density is greatest. The red line is Newton gravity and

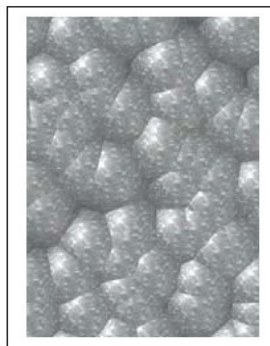
shows the drop in field strength as we move away from the mass and an increase in spatial volume and the point where it turns green is when MOND takes over. At this distance galactic rotation curves flatten out because space unit size stops increasing and the energy density of field is more constant. It appears the Gravity space unit volume has a maximum limit.

The distance line starts at Plank length and is crossed at the Emergent field blue line, which is quite expansive, and expanding the volume of space pushing galaxies apart once the space units are free of mass in the great voids. Space has momentum toward the center of mass and moves accordingly. When the space reaches the wall of the SSE it continues through the wall and emerges on the inside without changing direction or energy. Space on the outside and inside surfaces of the SSE has equal energy and direction of momentum but the volume changes. The changes in spatial volume come in 3 phases. Gravitational [Newton], Constant [MOND] and Expanding [Big Bang]. Each of these phases affects the volume or size of each individual space unit. Sort of like soap bubbles surrounding a particle with the smaller bubbles nearer the center and larger bubbles further out. See Fig.3

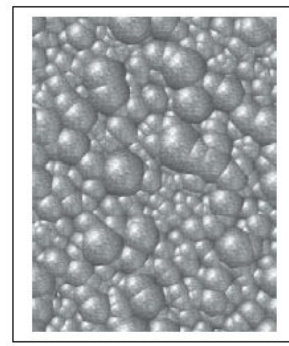
Fig. 3



Strong field near an extremely massive object



Weak field far from mass. The field appears constant



Mixed field of high and low mass objects. We occupy this type of field.

Gravitational is space near mass that follows Newton and is dynamic in volume. Gravitational space units are not homogenous. The units are smallest at mass and largest further out but have a limit on volume. Constant is space at flat galactic rotation curve such as MOND and has a more constant non-expanding volume. It is much further from the mass. Expanding is space in the large voids between galaxies that is expanding. It seems once space is freed from mass in a gravitationally unbound void it is free to expand. Expanding space has positive gravitational energy.

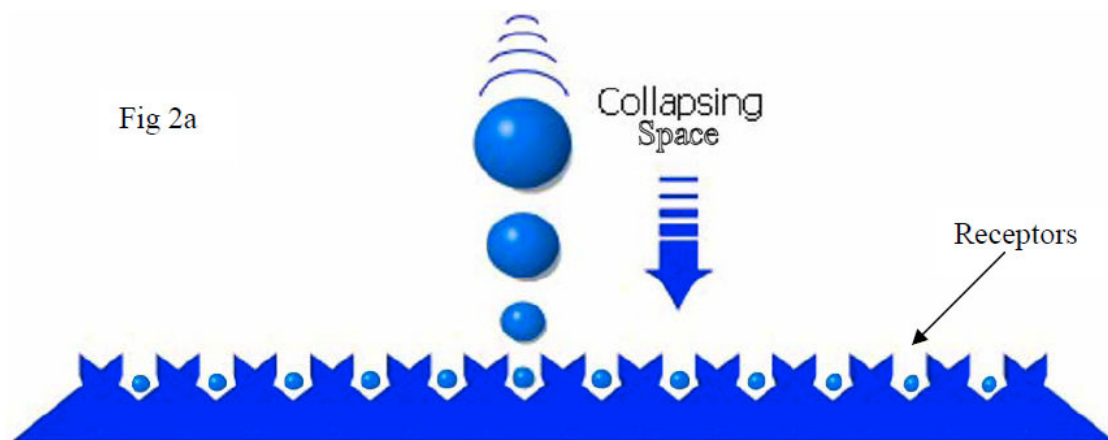
Each of these phases can be described by energy density or volume density. This is not the same as water phases because space remains fluid like in all 3 phases. These are changes in both location and volume but the emitted space is attached to the emitting mass in the first 2 phases [Gravitational and

Constant] but freed from it in 3rd or Expanding phase. The first 2 phases are emitted from a massive particle but the 3rd Expanding phase is emitted by black holes and possibly Neutron stars.

Gravity Space are packets of energy filled space that are extremely dynamic in volume and motion but constant in energy. The energy per space unit does not change, only the volume per spacial unit changes. The packets are completely loyal to the local host mass and move to the center of the host but get lost in a sea of other dynamic packets but the system remains non-homogenous. The space units touch but do not merge. This is where gravitational attraction takes place. Space does not move mass directly. It affects the gravitational space of lesser fields by imparting force on the field of space units. A strong field overcomes a weak field because many small units have much more energy than a few larger units. As the momentum information is exchanged via the SSE with the emitting mass it moves the mass to a new location. There is no direct interaction between mass and space outside the influence of the SSE. Outside a black hole all particles exist within their own local field of space.

### TIME

Space-time is a perfect term. Space brings the ticks of time to mass. If a Gravity field =  $MC^2$  then both particle and field share the same energy. This shared energy oscillates at the quantum level. Mass at rest has space flowing into it from all directions equally at the speed of light via the SSE. Picture a sphere absorbing the space all around it. Each receptor on the SSE must become occupied by a space unit. See fig. 2a.



Once all the receptors on the SSE are filled the particle oscillates and one tick of time occurs. Now if you accelerate the sphere it is no longer centered in the field and it absorbs the space on the windward side first and the space on the backside has to catch up. They are no longer in sync and the quantum ticks are delayed. The delay is equal to the acceleration and particle oscillation. Motion through space is measured by the constant speed of a gravity field at  $C$  catching up to the bound mass. But the gravity field is refreshed with each mass oscillation so time dilation is more evident near the speed of  $C$ . If the particle

were traveling at  $C$  then the space units at the rear would never over take it and time would stop. Also if the particle were to exceed  $C$  then the space at the rear would have to be torn apart. Mass exceeding  $C$  seems highly unlikely.

## INERTIAL MASS

As a particle is accelerated it gains mass. The question is, where is the added mass stored? Energy must be added or drawn from the gravitational field in order for the mass to change motion or energy. The entire space field of the massive particle is updated to any change in direction or speed with each oscillation of the particle. Until the position is updated, the entire field resists motion. Accelerating mass must accelerate its gravity space. Inertial mass is equal to the gravitational field of the mass so space unit count must increase as mass increases.

As the particle speed increases the physical size of the particle does not increase but the local gravitational field increases. If spacial energy is constant per unit then spacial unit count will increase as the mass is accelerated. So the added mass energy is transferred to the gravitational field. If the local gravitational field =  $MC^2$  then gravitational space units increase in numbers around an accelerating mass.

## MOMENTUM

Why does an object in motion stay in motion and resist change? If a particle is traveling through space why doesn't space cause a drag and slow it down? The answer is simple. The particle is emitting the surrounding space with the same momentum of the particle so the particle is not moving through space. It is riding along in its own space.

## GENESIS

When a black hole converts mass to expanding space what are the properties of the newly expanding space? I feel this phase is still ruled by the same quantum and thermodynamic properties of the other phases. If so then the unbound space expansion energy can convert back to a massive particle out in the voids. Galaxies may recycle their mass into new galaxies. This may also account for the abundance of star formation at the fringe of galaxies with super massive black holes at their center.

## CONCLUSION

It is obvious that space has far more properties than we thought just by reason of observational studies. Cold dark matter, dark energy and galactic rotation anomalies are some of the serious problems we have had since Einstein's GR. This work only tries to carry on by modifying and adding to GR so it will fit both the old and the new discoveries using only the properties of space without introducing exotic matter, energies or unlimited dimensions. In this work space still appears to curve into mass but it is also set in motion. By dividing space into units and setting them in motion we had a start. Determining direction of motion was a no-brainer but the volume and energy per unit was a struggle

without violating energy conservation and also a way had to be devised to connect mass to space. So I borrowed from the Brane and Hologram people and out pops the SSE which brings us back to Schrödinger and Einstein. They liked to see wave structures in nature. If you were to describe the SSE in a few words you would have to say it allows space with its energy to flow continuously into mass and out again creating a standing wave encompassing an entire gravitationally bound system albeit a complex one given the number of massive particles within the system.

This may also be of interest to the loop gravity people. It is noted here that spacetime unit volumes are not confined to the Plank scale only. By starting out with a very large volume per space unit and allowing for volume contraction of local gravity space I have avoided violating energy conservation and the need for additional unlimited space units. . This was not an attempt to quantize GR but may help in some small way in the future due to the quantum looking nature of the above properties of space. Space was shown to be composed of collapsing spherical waves. But the precise measures of location, energy and volume are contrary to current quantum paradigms so it will not be easy to following that path. A different approach to quantum gravity may be needed because this follows the rules of mechanics without probability unless the location of emitted space turns out to be somewhat random. Also genesis is a problem for big bang followers but relies on some quantum rules. This problem of precise measure and quantum fluctuation will only be solved after more detailed study.

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