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Alternative Mechanisms of Dark Matter, Galactic Filaments and the Big Crunch

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Abstract This note describes some effects of: an attraction of space to mass, black holes' (BH) spatial capture, and an intrinsic property of space to expand: 1. Local, constant-speed, spatial rotation within galaxies and clusters explains stable, flat-speed, stellar orbits within galaxies and stable galactic orbits within clusters. Spatial movement enhances "gravitational" lensing around galaxies and clusters. Both of these phenomena are currently ascribed to dark matter. 2. Space, captured by super massive black holes (SMBH) and other BH, reduces spatial expansion pressure (an attribute of space itself) in the vicinity of galactic filaments, to maintain and sharpen these structures. 3. As the universe expands, galactic, spatial rotation rates increase to promote galactic collapse into ultra massive black holes (UMBH). These galactic masses acquire additional relativistic mass during accretion, which promotes universal collapse.

Keywords: *dark matter, galactic filaments, big crunch, space, black holes, galaxies, universal collapse*

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1. Introduction

Space is poorly understood, because we cannot see or directly interact with it. Its movement and capture should be considered as viable options to explain observed phenomena – including: fast, flat-speed stellar and galactic orbits, galactic filaments and galactic and universal collapse.

A companion paper (by this author) proposed that BH gravitationally capture space and release it when BH interact with each other or as inflation when they are destroyed in the big bang (BB).

1. Spatial rotation and movement explain stable, flat-speed [1], stellar orbits within galaxies, stable galactic orbits within clusters and spatial movement accounts for added lens effects around galaxies. Space, within galaxies and galactic clusters, acquires a rotational component. Spatial rotation reduces local galactic or cluster rotation speeds, within their local spatial reference, to maintain flat-speed stellar and stable galactic orbits (without invoking dark matter). Spatial movement adds extra light-bending to expected gravitational lens affects; as space moves toward galactic masses to replace space lost into their central SMBH.
2. Space captured by SMBH reduces spatial expansion pressure (an attribute of space itself) in the vicinity of galactic filaments. This local slowing of spatial expansion maintains and sharpens galactic filaments. As empty-space regions expand more rapidly than space within filaments, they nudge galaxies to maintain and sharpen the filaments.
3. As the universe expands, galactic, spatial rotation rates increase due to their weakened connections with universal space. These faster rotations of the galactic space slow local orbit speeds to promote eventual galactic collapse into ultra massive black holes (UMBH). After collapse, UMBH contained mass and energy from their original SMBH, accreted galactic masses and the added relativistic mass that the galactic masses gained as they fell through the crushing gravity of their newly-formed UMBH. The significant added relativistic mass, that the new UMBH acquired, increased mutual UMHB attractions to promote universal collapse.

Spatial attractions to galactic or cluster mass continue to rotate space within these entities to maintain stable internal orbits despite our observations of higher-than-stable galactic or cluster orbital speeds (without dark matter). And spatial expansion, as a fundamental attribute of space itself, explains big bang inflation, continued universal expansion (without dark energy) and continuing existence of galactic filaments.

2. Spatial Rotation and Movement Obviate Dark Matter

Galactic space rotates to stabilize flat-speed stellar orbits. Likewise it also moves similarly with galactic clusters to stabilize galactic cluster orbits. Both structures have BH at their center ($\sim10^{+6}$ solar mass for galaxies and $\sim10^{+13}$ sm for clusters). These black holes also draw space toward themselves and capture it, to create a flow of space toward the structures' center. This flow increases the "gravity" that galaxies and clusters project and depletes spatial presence in and around the galaxies or clusters. As space moves into galaxies, it acquires rotation from preexisting space. These radial components produce the "flat" orbital-speed profile common to stars in most galaxies. Thus galactic stars orbit normally within their local galactic space.

The origin of spatial rotation is not clearly evident. One possible explanation: Spatial rotation began during an era of high-speed galactic mass rotation, when SMBH growth shifted to galaxy building. This shift likely occurred when straight-in, all-angle SMBH bombardment shifted to an accretion disk mechanism. This mechanism shift began galaxy-building as early, fast universal inflation moved accretion trajectories out into high speed galactic orbits. The dense, high speed plasma or gas pulled space along with them to initiate spatial rotation. This spatial rotation stabilized galaxy expansion by establishing stable galactic orbits within the local rotating space. Regardless of its origin, galactic spatial rotation is a reasonable explanation of the flat, high-speed, galactic orbits, that we observe today.

Galactic orbital velocity curves [1] have 3 unique features, all of which fit wellwith spatial rotation:

1. Galactic orbit velocity curves are flat over most of their galactic radius. Constant orbital velocities are consistent with the underlying spatial rotational rates. The spatial disks rotate with constant tangential velocity, beyond a central dead zone. Space in the outer circles of a galactic disk carries velocity from inner circles to move at a constant radial velocity (and a slowing angular velocity). Thus space moves as a pliant medium to maintain radial velocity, and not as a rigid disk to hold angular velocity constant.
2. The average orbital velocities are similar from galaxy to galaxy. These similar velocities imply that a similar process occurred in all galaxies, rather than following a dark-matter driven mechanism, which would likely mirror galactic sizes and yield more size-related speeds in their orbits.
3. Stars' velocities increase rapidly over the first 5 to 10 thousand light years from the galactic centers. This unusual velocity distribution indicates that the stars' speed drivers are not effective near the galactic center, where moving spatial vectors would conflict with each other. This observartion is consistent with rotating space that would possess a central dead zone with rotation speed picking up with increasing distance from the galactic center. It is difficult to visualize how a dark-matter driven speed distribution would produce this orbital velocity profile consistently in all galaxies.
4. The bump in stellar rotation velocities just after the initial speed increases suggests that this region may be the source of near-constant velocity rotation for the rest of that galaxy. A dense concentration of fast moving stars in this region may pull space to follow them in its rotation. Again, the similar radii of these bumps implies the their positions are more dependent on dead space considerations than on galactic size.
5. Shallow waves in the Milky Way velocity curve, just after the velocity bump, may be remnants of recent interactions with smaller galaxies. These interactions could impact spatial rotation speeds directly (from interacting spatial velocity vectors), or they could inject bands of faster or slower stars into the galactic disk, and draw rotating space to follow them.

Thus, it is easy to visualize that space moves in exactly the flat rotation speed pattern that we see reflected in stellar orbit speeds. Whereas, it is more difficult to see how dark matter, as the proposed dominate gravity source associated with galaxies, could consistently arrange itself to produce these unanticipated rotation speed profiles.

Spatial movement maintains stable stellar orbits within galaxies and stable galactic orbits within clusters, even though the stars and galaxies appear to move at speeds above those consistent with the visible matter constraining them. Keep in mind that galaxies and galactic clusters have similar structures, with a massive central black hole and smaller stars and galaxies orbiting about them. Space rotates within a galaxy or a galactic cluster, at constant radial velocities in the direction of stellar or galactic orbits. Rotation of space, with a galaxy or galactic cluster, moves their local spatial reference with them to eliminate the disparity between observed galactic or cluster rotation speeds and the lower rotational speeds consistent with stable stellar or galactic orbits, given observed galactic or cluster mass.

Dark matter represents a static system that cannot adjust its gravity to accommodate the increasingly "faster" (expanded-orbit) stars or galaxies traveling in their new and expanding orbits (due to spatial expansion) within a galaxy or galactic cluster. Spatial expansion maintains initial stellar or galactic speeds so that they appear to move "faster" than necessary when spatial expansion moves them into expanded "slower" orbits within galactic disks or galactic clusters. Thus we see stars and galaxies moving ever faster than would be consistent with their observed galactic or cluster masses. Fortunately, the local space, within the galaxies and clusters, can also rotate faster to accommodate these new, faster-than-necessary orbit speeds and keep orbit speeds appropriate within the local moving space of their respective groups.

Space, surrounding galaxies, is drawn toward them by the galaxies' gravity, to replace space captured by their SMBH. This spatial movement adds to the gravity-based optical lens effect. Again, as space moves in response to its gravitational attraction to mass and to replace space captured by BH, this movement enables observations that are currently attributed to dark matter, but are simply explained by spatial movement. While SMBH at the centers of galaxies capture space to leave a reduced spatial presence near the galactic center, the galaxies themselves present the major gravitational attraction in their vicinities, and draw space into themselves directly. This spatial movement significantly augments gravitational lenses to cause the observed increased light-bending, which is currently attributed to dark matter. Smaller objects, like our sun, gravitationally bend space, but lack the gravity to capture space into themselves (space is quite rigid over planetary distances but can move more flexibly over galactic distances). Thus, as a photon enters the space "above" a galaxy, moving parallel to the galactic plane, its path bends from space curved by galactic gravity, and even more from space moving toward the galaxy during its ~10^{+5} year trip across the galaxy.

3. Galactic Filaments

Early galactic filaments initially formed as BB inflation bubbles (released from detonated UMBH) moved surviving stellar mass black holes (stBH) and plasma mass into intersection lines between them, and currently spatial movement toward these filaments maintains them. The BB released previously captured space as inflation by detonating of billions of UMBH. This inflation appeared as local inflation bubbles with surviving stBH initially occupying the margins between them, then forming filaments as they moved to more stable positions along multi-bubble intersection points. Gravity from the early appearance of supper massive black holes (SMBH) and latter their associated galactic masses encouraged continuance of these associations before the universe expanded to a point that galaxies would have little influence on their neighbors' movements. The galactic filaments that we see today (Figure 1) are the end result of early galactic associations *and* continued spatial movements toward the filaments to maintain and sharpen them. (Inter galactic gravity seems too weak and undirected to hold galaxies in organized filaments.) However, spatial movement from empty regions toward filaments would keep them sharp and distinctive. This movement occurs because space is being swallowed up by the SMBH at the center of each galaxy within the filament and, to a lesser extent, by stellar mass BH (stBH) scattered throughout the galaxies. This process reduces spatial presence in the vicinity of filaments; and, to the extent that expansion pressure is an intrinsic property of space, this reduced spatial presence slows spatial expansion within the filaments, and further slows expansion within the galaxies themselves.

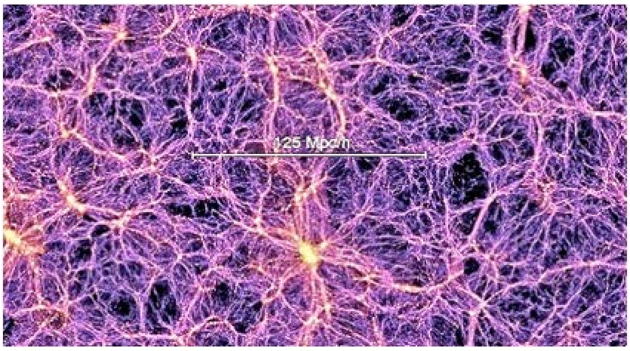

Figure 1. Galactic Filaments; Optical/UV: NASA/STScI; Radio: NSF/VLA/CfA/D.Evans et al., STFC/JBO

Space seems to have the properties of a stiff gaseous lattice: It expands to fill voids that appear near black holes, at the same time that it strains to maintain a consistent 3-D lattice over inter galactic distances. Thus, as space moves to compensate for the space lost into BH, it pushes broad swaths of space toward galactic filaments, and maintains their sharp structure.

4. Galactic and Universal Collapse

Hypothetically, galactic spatial rotation, carried forward in time, may begin events that culminate in both galactic and ultimately universal collapse. As the universe expands, ties between a universal space and rotating galactic space weaken faster than galaxies expand. (Spatial framework weakens as universal volume expands; whereas, galactic expansion is slowed due to reduced spatial presence within the galaxies from spatial acquisition by their central SMBH.) These weakening ties allow local, rotating, galactic space to turn faster and move closer to galactic rotational speeds. As rotating space moves faster, local galactic stellar rotation speeds are effectively reduced with regard to their galactic orbits – thought they do not change speed to an observer. Loss of internal galactic orbital speed thus begins the process of galactic collapse. As galaxies collapse, their orbiting mass falls into their central SMBH, which then becomes an UMBH, as they acquire the mass of their associated galaxies. In addition to galactic mass, UMBH also acquire the added relativistic mass of all objects falling through their intense gravity, which adds significantl relativistic mass to their initial "rest" mass. Thus the gravitational attractions of newly formed UMBH significantly exceed the combined attraction of their former SMBH and their associated galaxies. This significant increase of gravitational attraction as galaxies become UMBH, may be enough to reverse universal expansion and begin its "Big Crunch" collapse. The above scenario is one answer to the question of how galactic and universal collapse might occur. And the new relativistic mass, which was created during galactic collapse, makes the succeeding universe larger than its predecessor (regardless of how the big bang occurred).

5. Conclusion

Our inability to find either dark matter or dark energy suggests that a massless dark matter description may obvitate both by eliminating the requirement for dark energy to counteract dark matter's gravity. Thus neither dark matter nor dark energy may be necessary to describe both flat speed stellar orbits and accelerating universal expansion.

List of Abbreviations

AMBH	Astoundingly Massive Black Holes
BB	Big Bang
BH	Black Hole(s)
sm	Solar Mass
SMBH	Supper Massive Black Hole(s)
stBH	Stellar Mass Black Hole(s)
UMBH	Ultra Massive Black Hole(s).

References

[1] Bennett J. O., Donahue M. O., Schneider N., *The Essential Cosmic Perspective;* as viewed by searching: dark matter Arizona.