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

Short Title: Dark Matter & Galactic Filaments

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ABSTRACT

The preceding paper proposed that black holes (BH) gravitationally capture space and release it when they interact or are destroyed in the big bang. This note describes some less dramatic effects of: a general attraction of space to mass, BH spatial capture, and an intrinsic property of space to expand:

1. Spatial movement and rotation explain stable stellar orbits within galaxies, stable galactic orbits within clusters and added lens effects around galaxies. Space, within galaxies and galactic clusters, acquires a rotational component as it moves toward the structures' central BH. The speed of this rotation is radius dependant, as orbiting stars or galaxies pull space to follow their orbits. Spatial rotation reduces galactic or cluster rotation speeds, within their local spatial reference, to maintain stable stellar and galactic orbits (without invoking dark matter). Spatial movement produces added lens affects; as galactic masses draw it toward themselves to replace space lost into their central super massive BH (SMBH).
2. Space captured by super massive black holes (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 weakened connections with the universal space grid. These faster rotations of the galactic spatial grids promote eventual galactic collapse into ultra massive black holes (UMBH). After collapse, UMBH contained their original SMBH, galactic masses and the added relativistic mass acquired by galactic masses as they fell through the crushing gravity of UMBH. The significant added relativistic mass, of the new UMBH, increased their mutual attractions to initiate universal collapse.

Spatial attractions to galactic or cluster mass 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.

SPATIAL MOVEMENT AND ROTATION OBVIATES DARK MATTER

Space flows within galaxies in currents that stabilize stellar orbits. Likewise it also moves similarly through galactic clusters to stabilize galactic orbits. Both structures have BH at their center (~10^{+6} solar mass for galaxies and ~10^{+13} sm for clusters). These black holes draw space toward them and capture it, to create a flow of space toward the structures' center. This flow increases the "gravity" that stars and galaxies experience and depletes spatial presence in and around the galaxies or clusters. However, as space moves to follow stars and galaxies, it acquires a rotational component, that likely has even greater impact to stabilize their orbits. This rotation moves the local spatial reference in the direction of the orbiting bodies, and this rotation slows the local orbit speeds of stars and galaxies within their space.

Spatial movement maintains stable stellar orbits within galaxies and stable galactic orbits within clusters, even though the stars and galaxies appear to be moving 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. The attraction of space to mass causes space, within a galaxy or a galactic cluster, to rotate at radius dependant angular velocities in the direction of stellar or galactic orbits. This movement represents a competition between spatial stiffness and its attraction to mass. Thus, galactic space rotates faster near the galactic center where denser mass moves faster and spatial ties are weaker, than it moves near the galactic edge, where fewer stars move at a slower pace and spatial ties are closer to their universal reference. Similar arguments apply to galactic clusters. Any rotation of space, with a galaxy or galactic cluster, moves their spatial reference with them and reduces 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. The stellar mass black holes (stBH) within each galaxy or SMBH within clusters give additional encouragement for the "local" spatial framework to follow galactic or cluster rotation. To the extent that the implied galactic rotational gravity (gravity needed for stable stellar orbits) exceeds galactic attractive gravity, a rotating galactic spatial reference may explain part of the discrepancy. And similarly, to the extent that the implied cluster rotational gravity (gravity needed for stable galactic orbits) exceeds cluster attractive gravity; a rotating cluster spatial reference may explain part of that discrepancy as well.

High-speed stellar orbits within galaxies and galactic orbits within clusters are the likely result of spatial expansion. Although galactic space expands more slowly than void space because galactic space is depleted due to its constant loss into their central SMBH, it still expands. Reduced spatial presence, in the hemisphere above and below the galactic disk, also reduces the strength of ties to the universal lattice and facilitates rotation of space within the galactic plane to follow galactic rotation. Similar arguments apply to galactic clusters, which orbit about an astoundingly massive ($\sim 10^{+13}$ solar mass) black hole (AMBH), but on a larger scale (AMBH described in "Novel Descriptions …", viXra 1401.0231).

Note that this system of shifting spatial rotation within a galaxy or within a cluster is a dynamic system that can adjust to fit changing circumstances brought on by spatial expansion. Dark matter represents a static system that cannot adjust its gravity to accommodate the increasingly "faster" stars or galaxies traveling in their new and expanding orbits (due to spatial expansion) within a galaxy or galactic cluster. Spatial expansion maintains original 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 (without a changing reference) stars and galaxies appear to move ever faster than would be consistent with their observed orbits -- given their galactic or cluster masses. Fortunately, the spatial references, 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 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 causes the optical lens effect observed around galaxies. Again, as space moves in response to its gravitational attraction to mass, this movement produces observations that are attributed to dark matter, but are more simply explained by spatial movement. While SMBH at the centers of galaxies draw in 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 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 them (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 $\sim 10^{+5}$ year trip across the galaxy.

2. GALLACTIC FILAMENTS

Early galactic filaments initially formed as big bang (BB) inflation bubbles moved surviving stellar mass black holes (stBH) into intersection lines between them, and spatial movement toward these filaments currently maintains them. The BB released inflation from detonation of billions of ultra massive black holes (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.

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.

3. 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 reference frame 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 because of spatial acquisition by their central SMBH.) This weakening allows rotating galactic space to turn faster and move closer to galactic rotational speeds. As rotating space moves faster, 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 become an ultra massive BH (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 into them, which adds significantly to their total 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).

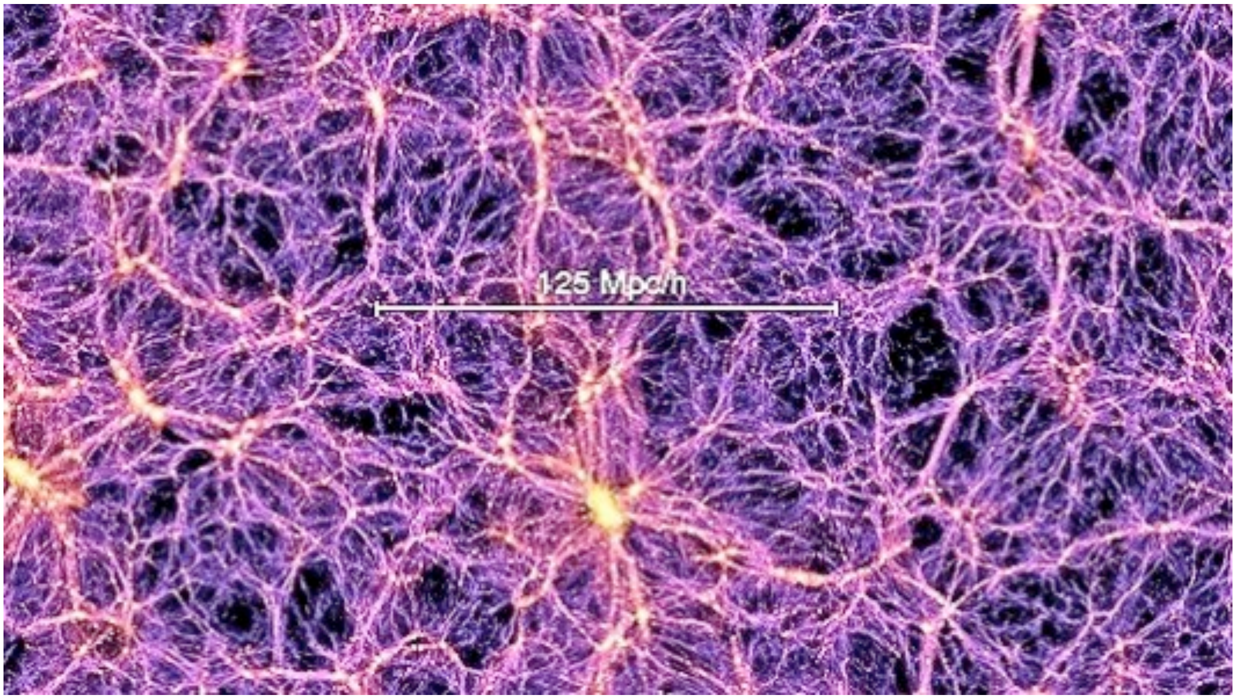

Figure 1. Galactic Filaments; Optical/UV: NASA/STScI; Radio: NSF/VLA/CfA/D.Evans et al., STFC/JBO