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Spiral Galaxies Support Rotating Space as "Dark Matter" Mechanism

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Abstract Spiral galaxies, from galactic collisions, provide additional support for rotating space as the enabling mechanism of high-speed, galactic, stellar orbits—currently attributed to "dark matter". The bars, spirals and the sharp transition between the two are simply explained by rotating space. The inner bars indicate linear spatial speed increases over their radius. Smooth spiral arms form due to constant-speed, tangential rotation in outer galactic regions. And sharp transition points, between the two, indicate an abrupt change from linearly increasing spatial speed to constant rotation speed in the outer galaxies. Dark matter gravitational fields would have significant difficulty routinely producing these effects.

Keywords: *dark matter, space, spiral galaxies, spiral arms, galactic bars, and galaxy*

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1. Introduction

The paper: "Novel Descriptions of the Big Bang, Inflation, Galactic Structure and Energetic Quasars" [1] describes galaxy formation as the result of an interaction of rapid spatial inflation with an accretion disk, which formed about a recently developed super massive black hole (SMBH). Inflation moves accretion disk components out from their accretion trajectory into fast galactic orbits about their central SMBH. These components still possess much of the speed and energy they had acquired in the accretion disk, and would simply escape "galactic" gravity, without some additional constraint on their motion. According to current theory, "dark matter" provides this constraint. However, in the note, "Alternative Mechanisms of Dark Matter, Galactic Filaments and the Big Crunch" [2] rotating galactic space more simply describes high-speed, galactic orbits [3] and provides a more viable constraint to speed-induced galactic disintegration. Here local galactic space rotates to follow fast moving galactic stars. And, within this rotating *local* space, stars move at rates that enable their containment by galactic gravity, without dark matter – even though an outside observer sees much higher rotation speeds. Thus speed, within local space, determines the gravity needed to hold galactic stars in stable orbits. Note that similarities, in maximum stellar rotation speeds, between large and small galaxies, still allow development of larger galaxies around larger SMBH. The larger size results from larger and possibly faster initial accretion disks, which push some orbiting matter farther out from the galaxies' centers, to reach its stable orbit size.

The note below examines additional evidence from spiral galaxies for spatial rotation and it also suggests that rotational resistance, from intergalactic space, limits spatial rotation speeds to yield similar maximum stellar rotation speeds (noted in reference 2.) in all sizes of galaxies.

2. Spiral Galaxies Support Spatial Rotation

Stellar orbital rotation rates (as described in reference 2) remain as strong evidence for galactic spatial rotation as the mechanism of "dark matter". However, three remnants of galactic collisions provide additional support of rotating space as the mechanism of stable, high-speed, galactic stellar orbits. These orbit speeds are currently attributed to elusive "dark matter". The remnants are:

1. Stellar bars and spirals – dense bands of stars in spiral galaxies, which formed as collision-altered rotating space sped up or slowed stars to concentrate them into the bands of stars which formed the bars and spirals, we see today.
2. A sharp transition from bars to spirals – this abrupt transition results from a quick change in spatial rotation, from linearly increasing rotation rates out to the transition point, to constant rotation rates beyond it.
3. Galactic clouds—freed from colliding galaxies as conflicting spatial rotational vectors cancelled each other, to let galactic sections move freely away from their parent galaxy. (A local, fast-rotating spatial framework had previously enabled galactic gravity to constrain these sections to stable orbits.)

Spiral galaxies often include a straight bar of stars at their center with spiral arms bending about them. Our Milky Way galaxy, in Figure 1, illustrates the bar and arms of a spiral galaxy. Galactic collisions purportedly produce spiral galaxies. These collisions produced interacting bands of moving space by combining their vectors at intersection points. Following a collision, seemingly smooth continuance of spatial rotation into previously-impacted, spiral galaxies suggests that rotating space either survives these encounters with other rotating space, or quickly reestablishes itself after them. Dark matter structures would likely have experienced more significant disruption from galactic collisions.

The bands of stars likely formed as collision-altered rotating spatial bands sped up or slowed stars to concentrate them into the bands. Increased spatial speed (from spatial interactions) promotes faster stellar speeds: Faster moving space reduces stellar speeds *within local space*. This shift draws effected stars to lower orbits, which increases their rotation speed *to an outside observer*. By similar inverse arguments, slowed interactive spatial rotation, would lead to slowed stellar speeds. Both interactions would promote bands of stars, which subsequently developed into bars and spiral arms.

Barred, spiral galaxies support rotating space as the constraining mechanism of stable, high-speed, stellar orbits. The rotating space mechanism naturally enables galactic bar durability due to linear increases in spatial rotation rates from the galactic center to a compact transition point, where rate increases cease and spatial rotation rates become constant. Driver stars within the galactic bulge pull central space to rotate. Neighboring space transmits the pull exerted by these stars to its interior space. The "friction" between neighboring space is constant, so that its speed increases linearly from the still galactic center to the transition point. (Transition-point space pulls interior space to keep up with itself, but stationary central space resists any movement. Thus spatial speed increases linearly between the two "locked" speeds to maintain a constant derivative to its speed.) Constant speed increases of interior space enables bar structures to endure. The length of bar structures indicates the stiffness of space over distance as central space resists moving in conflict with space across its galactic center, while it also seeks to follow faster-moving space farther out from the galactic center. A dark matter based mechanism cannot easily generate a gravitational field that produces the precisely linear stellar speed increases needed to maintain stable galactic central bars. (Gravitational fields normally exhibit squared functionality.)

Figure 1. Milky Way Galaxy

Spatial rotation also easily explains the sharp transition from galactic bars to spiral galactic arms. This transition occurs where spatial rotation driver stars become incapable of pulling their space to rotate faster than their interior space. Bars of stars develop because spatial rotation rates increase linearly (to maintain constant angular velocity) with increasing distance from the galactic center. Eventually, orbiting galactic stars reach the transition point, and rotating space, with its associated stars, quickly shifts to constant-speed rotation in the outer galactic region. The surprising similarity, in maximum stellar speeds from small to large galaxies, strongly suggests that some interaction, in addition the speed-promoting effects of galactic bulge stars, is responsible for this speed limitation. Nearby intergalactic space is the likely source of this speed similarity. Intergalactic space is stable, and it is constrained by space of the universal framework. Its speed-limiting influence would be intrinsically independent of galactic size, and its presence would be "constant" across the universe for both small and large galaxies. Rotational rate transition zones fall within the galactic central bulge at the point where fast moving concentrations of stars can no longer pull space to move any faster. However within the bar radius, spatial rotation speeds increase linearly with its radius, so that faster-moving, outer bar stars can move in stable orbits while maintaining the straight bar shape. These linear speed profiles develop from no rotation at the galactic center, to maximum speed at the transition distance, where rotation speeds quickly tip to become constant. Gravitational fields from dark matter would have great difficulty producing fields with sufficiently abrupt breaks cause the observed sharp transitions from bars to spirals.

Spiral arms develop in the outer galactic regions, just beyond the bar ends, where spatial rotation speeds become constant out to the galaxies' edge. Here bands of stars spiraled behind themselves, as slower *angular* rotation of constant-radial-speed, outer galactic space, caused outer galactic band sections to lag behind their interior galactic neighbors. Thus, beyond the transition point (where constant-radial-speed rotation reigns) angular spatial rotation speeds slow linearly (with increasing radius) to naturally create the beautiful, smooth spiral arms characteristic of these regions. Dark matter's gravity is likely incapable of producing the linearly decreasing angular speeds that naturally generate gracefully smooth spiral arms.

3. Galactic Clouds

Separate galactic clouds were likely freed from their parent galaxies, as conflicting spatial vectors cancelled each other to release galactic sections. These sections had been previously held in stable orbits by their galactic gravity within rotating space. Examples of these common clouds include the Magellanic Clouds of our Milky Way and multiple clouds near the minor Death Star galaxy. The clouds separated from their parent galaxy, when the rotating space of an intruding galaxy cancelled some their local rotating space, and straightened the sections' trajectories to a path that eventually moved them beyond the colliding galaxies. These sectional separations would have been more for difficult for diffuse dark matter, because its gravity vectors are more consistent than the abrupt changes possible with conflicting rotating spatial vectors.

4. Discussion

In conclusion, moving space can easily produce straight galactic bars, smooth spirals arms, and sharp transitions between them, along with separate galactic clouds. Bars and arms form with continuing spatial rotation following galactic collisions, and freed clouds come from spatial interactions during these collisions. It is difficult to see how dark matter would routinely produce the features above, when galaxies collide. If we apply Occam's razor to theories of galactic behavior, rotating space seems simpler than contorted distributions of elusive dark matter.

References

[1] Jay D. Rynbrandt, *Frontiers of Astronomy, Astrophysics and Cosmology*, Vol. 2, No.1, 2016, pp 24-34.

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