

Does dark matter exist?

Arieh Sher

Abstract

Dark matter (DM) is a hypothesis suggested by scientists to explain the flattened velocities curves of stars in galaxies. The observed velocities of stars in galaxies are not in accord with Kepler's law. The hypothesis of dark matter solves mathematically the observations. However, a near-century search for DM has not produced any results.

My claim is that there is DM except that an observer located in the visible universe cannot observe it. The DM is concentrated at the center of the matter universe as a massive spinning neutron star. From the general relativity (GR) point of view, this neutron star is a black hole. Therefore, an observer can't observe the neutron star as it is located inside the event horizon of the black hole.

Current status:

The dark matter hypothesis was suggested by scientists to explain cosmological observations. The first that coined this term was Fritz Zwicky, in 1933, to explain observed galaxies velocities of the Coma cluster. He estimated that the mass of the cluster is much more than the total mass of galaxies that were visually observed. He hypothesized that there is an additional mass hidden from view in the universe which he called dark matter.

The same conclusion of DM existence was given by Vera Rubin and coworkers in 1978, based on measurements of star velocities in galaxies. She found that the velocity curves of stars orbiting the center of the galaxy are flat, no matter the distance of the star from the center. This finding contradicts Kepler's observation in the solar system where the farther a planet is from the Sun its velocity gets smaller. If Kepler's law is used in a galaxy the outer stars should have been ejected from the galaxy. However, this is not the case and galaxies seem to be stable. The existence of additional DM can explain the flattening curve of stars in galaxies. The DM hypothesis claims that DM reacts with ordinary matter only by gravity and it has been calculated that 85% of matter in the universe is DM whereas 15% is ordinary matter i.e., 5 times more dark matter than ordinary matter.

For nearly a century, many experiments to detect DM have been done, some by satellites observing space in and around galaxies and some located deep below the surface of Earth. However, so far, all of them failed. This raises serious doubt about the validity of the BB theory.

Nevertheless, I claim that DM exists. In the next paragraph, I describe a structure of the universe that can explain the conundrum of DM.

The structure of the universe

I concur with the claim of the BB theory that our visible universe started with an explosion. However, this explosion was not of a singularity point that had a very high temperature and infinite density, but rather of a huge spinning primeval neutron star. I object to the BB claim that before the explosion there was nothing and that space, time, and matter originated from the BB explosion. On the other hand, I concur with Newton that claimed that space is eternal, absolute, infinite, and permeates everywhere in the universe. It exists without relating to the matter. I also agree with Newton that time is eternal, absolute, and passes not related to anything.

This primeval neutron star was built gradually in space from the accumulation of neutrons that originated from the infinite vacuum energy. My conjecture of how it was done is described in [The origin of matter](#).

Although the vacuum energy is infinite the primeval neutron star did not grow without limits. Its growth was limited by physical parameters. I use two parameters: 1) Maximum density observed in the universe - this is the density of the neutron $\sim 7.8 \cdot 10^{17} \text{ kg/m}^3$. 2) Maximum acceleration possible in the universe $\sim 1.6 \cdot 10^{20} \text{ m/sec}^2$. From these two parameters, the mass and size of the primeval neutron star can be calculated. The mass of the primeval was $1.24 \cdot 10^{54} \text{ kg}$ and its radius $7.24 \cdot 10^8 \text{ km}$. The calculation is detailed in paragraph 3 – “The Primeval Universe” of [The structure of the Pivot Universe](#).

When the primeval neutron star reached the maximum acceleration possible in the universe it exploded into two distinct parts. The major part of the spinning neutron star stayed in its place, I designate it as the Pivot, and the other part, the visible universe, flung off tangentially and started to orbit the Pivot on the equatorial plane of the Pivot in the shape of a flat disk. This description is contrary to the BB theory that claims that after the explosion all matter moved radially in all directions.

The mass of the Pivot and the mass of the visible universe are calculated based on mass conservation law and angular momentum law. The Pivot mass is $7.82 \cdot 10^{53} \text{ kg}$ and the mass of the visible universe is $4.3 \cdot 10^{53} \text{ kg}$. The ratio between the Pivot mass and the mass of the visible universe is ~ 1.8 . The calculations are detailed in paragraph 4. “The structure of the Pivot Universe” of [The structure of the Pivot Universe](#).

The structure of the Pivot Universe is simple and resembles other structures observed in the universe, i.e., a central massive celestial body and other smaller celestial bodies orbiting it. For example, this is the structure of the solar system and the structure of galaxies. However, the structure of the Pivot universe is not so simple. It was mentioned above that from GR's point of view the Pivot is a spinning black hole. In this case, according to GR space is frame dragged by the Pivot. GR's conclusions must be included in the structure of the universe. The description of the Pivot as a black hole also explains why no radiation can escape from the Pivot. On the other hand, the gravity of the neutron star, inside the black hole, can cross the event horizon and influence celestial bodies around it. From the description above one may wonder if the Pivot is a neutron star or a black hole. I claim that a black hole and a neutron star are the same. What makes the difference between them is the event horizon. The event horizon of the black

hole is bigger than its physical radius, whereas the neutron star has a physical radius that is bigger than its event horizon. See: [Is a black hole a neutron star?](#)

In the case of the Pivot - its physical radius is $6.2 \cdot 10^8$ km, whereas its event horizon is 122.8 billion light years. Notes: For comparison only, the distance of Jupiter from the Sun is $7.8 \cdot 10^8$ km. This size of the Pivot is impressive, but it is dwarfed when compared to its event horizon. The ratio is $6.2 \cdot 10^8 \text{ km} / 122.8 \text{ billion light years} = \sim 5 \cdot 10^{-16}$.

Verification

A scientific theory must explain all observations and measurements. A great part of my hypothesis relates to the verification of cosmological observations. For example:

1. [Spiral galaxies - explanation for their shape and the velocity curve flattening](#)
2. [Is there an explanation for Hubble's constant crisis?](#)
3. [Does the JWST disprove the Big Bang?](#)
4. [The conundrum of handedness direction of rotation of galaxies](#)