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VEDIC COSMOLOGY AND THE ENIGMA OF DARK MATTER: PHILOSOPHICAL INTERPRETATIONS

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ABSTRACT

Modern astrophysics is confronted with the mystery of Dark Matter; an invisible, non-luminous substance that constitutes the majority of the universe's mass and influences its structure through gravity. Though the Vedas do not explicitly mention dark matter, their philosophical and cosmological frameworks offer profound metaphysical ideas that resonate with contemporary cosmological theories. This article explores interpretive parallels between Vedic cosmology and the concept of dark matter, focusing on principles such as Avyakta (Unmanifest), Prakriti, Tamas, Akasha, Maya, and the subtle realms described in yogic and Puranic texts.

KEYWORDS: *Vedic Cosmology, Dark Matter, Prakriti, Avyakta, Maya, Akasha, Tamas, Sukshma Sharira, Gravitational Binding, Subtle Energy.*

1. INTRODUCTION

Modern science defines dark matter as a form of matter that does not emit, absorb, or reflect light, making it invisible to electromagnetic detection. However, its gravitational effects on galaxies and cosmic structures are well-documented. This hidden yet influential nature invites comparisons with Vedic ideas of the unmanifest, the subtle, and the concealed aspects of reality. Vedic cosmology, particularly from the Upanishads, Puranas, and later Vedantic commentaries, contains philosophical ideas that can be interpreted analogously to modern notions like dark matter and dark energy. Vedic thought may be esoterically or philosophically interpreted in relation to dark matter and its origin.

Vedic texts offer a unique perspective on the cosmos, often blending spiritual and metaphysical concepts with descriptions of the universe. While they don't explicitly mention "dark matter" in the modern scientific sense, some interpretations suggest that Vedic cosmology describes unseen forces and energies that could be analogous to dark matter and dark energy.

For example, Hindu cosmology speaks of different states of matter and cycles of time, emphasizing the existence of subtle, imperceptible forces that influence the physical world. Some scholars and enthusiasts have attempted to align these ancient descriptions with contemporary scientific theories, proposing that Vedic texts may hint at the presence of unseen cosmic substances.

2. AVYAKTA AND PRAKRITI: THE UNMANIFEST SUBSTRATE (SĀṄKHYA PHILOSOPHY)

Sāṅkhya Philosophy describes two fundamental realities Prakriti (matter) and Purusha (consciousness). Some interpretations suggest that Prakriti includes subtle, imperceptible forms of matter, which could be analogous to dark matter. Sāṅkhya is one of the six classical schools of Indian philosophy, attributed to Sage Kapila. It is a dualistic system, distinguishing between: Purusha (pure consciousness) the eternal, unchanging observer. And Prakriti (primordial matter) the dynamic force responsible for creation. Prakriti is composed of three fundamental qualities (gunas): *Sattva* is balance, intelligence, and purity. *Rajas* – activity, energy, and passion. *Tamas* – inertia, darkness, and stability.

These qualities interact to form the material universe, including the Mahābhūtas (five great elements: ether, air, fire, water, and earth). Some scholars suggest that the concept of subtle matter in Sāṅkhya could be analogous to dark matter, as it describes imperceptible forces influencing the physical world.

Sāṅkhya philosophy has intriguing parallels with modern physics:

- Quantum Field Theory & Prakriti: Just as quantum fields give rise to particles, Prakriti is seen as the source of all material manifestations.
- String Theory & Vibrational Energy: Some interpretations align Sāṅkhya's concept of Spanda (cosmic vibration) with the oscillatory nature of strings in String Theory.
- Dark Matter & Subtle Elements: The unseen forces described in Sāṅkhya, such as Tanmatras (subtle sensory elements), could be compared to dark matter, which interacts gravitationally but remains invisible.

Avyakta (Unmanifest) is the invisible foundation of creation. In Sāṁkhya philosophy, creation emerges from the unmanifest (Avyakta), identified with Prakriti—a primordial, invisible source comprising the three gunas: sattva, rajas, and tamas maintain a dynamic balance. Tamas, which is associated with inertia, obscuration, and mass, may resonate with the nature of dark matter. Prakriti, in its unmanifest form, is beyond sensory

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perception, yet it is the root of all material manifestation. It existed before any creation or differentiation into the *Pañca-mahābhūta* (five elements).The Analogy to dark matter is that just as Prakriti remains unseen and imperceptible, but causes the visible world, dark matter cannot be directly observed but gives shape to galaxies and cosmic structures.

3. AKASHA: THE SUBTLE ETHER ELEMENT

In Vedic cosmology Akasha, the first of the five Mahabhutas (great elements), is considered the subtlest and most pervasive non-material. Akāśa is often mistranslated as "space" or "ether. It is the field in which sound propagates and the foundational space for all other elements to emerge. Some Vedic commentators describe ākāśa as the container of all potentialities, the substratum of both matter and energy.
If we look at its interpretive connection**,** the dark matter may be seen as a coarse or goss manifestation of this subtle substratum, governing large-scale cosmic structure invisibly, like akasha underlies all form; something which organizes galaxies without being seen

4. MAYA: THE VEIL THAT CONCEALS REALITY

Maya is the veil of illusion and the hidden universe. Advaita Vedanta introduces Maya as the principle that projects multiplicity and conceals the underlying unity of Brahman. Maya explains the discrepancy between reality (Brahman) and appearance (Jagat). While Brahman (the Absolute) is infinite and undivided, Māyā causes the appearance of duality and multiplicity. Dark matter's invisibility and yet essential role in shaping the cosmos is akin to how Maya operates—hiding true reality while enabling phenomenal manifestation.

5. PURANIC COSMOLOGY: INVISIBLE LOKAS AND SUBTLE PLANES

The Puranas describe multiple Lokas (invisible worlds) and subtle layers of reality beyond ordinary perception—from Bhuloka to Satyaloka and Patala. These are said to exist in subtle dimensions, yet influence events in the material world.

These hidden realms suggest a universe much more complex than the visible one, mirroring the idea that most of the universe's mass is hidden from view. One could view these subtle cosmic layers as analogous to hidden mass-energy domains that science is beginning to detect as dark matter and dark energy.

Anti-material Worlds concept: Some Vedic texts discuss realms beyond ordinary perception, such as Paravyoma (the transcendental sky) and Vaikuṇṭha (the spiritual world). These descriptions have been compared to theories of parallel universes and unseen cosmic forces.

Underworld and Darkness is another concept: The Vedas describe deep, dark realms beneath the earth, associated with demons and unseen forces. These descriptions of hidden, powerful entities influencing the material world have been loosely connected to the idea of dark matter

6. TAMAS AND THE SHIVA PRINCIPLE: GRAVITATION AND INERTIA

Tamas, the guna of inertia and obscuration, corresponds symbolically to the gravitational effects of dark matter. In Shaivism, Shiva as the force of dissolution may be linked to this binding, gravitating energy. In Shaivite cosmology, Shiva is sometimes equated with tamas, not in a purely negative sense, but as the force of dissolution, rest, and gravitation Shiva's centripetal force and Tamas reflect the attractive, structuring nature of dark matter. Shiva pulls things inward and ends the manifest cycle, a kind of gravitational principle. Some esoteric interpretations see Shiva's force as akin to gravitational binding energy, which is the chief effect we observe from dark matter.

7. YOGIC COSMOLOGYOR INSIGHT AND THE SUKSHMA SHARIR

Yogic texts describe gross (Sthula), subtle (Sukshma), and causal (Karana) bodies or layers of reality. The Sukshma Sharir or realm contains pranic currents, chakras, and nadis that are not visible but govern life and consciousness. Just as subtle energies govern the body invisibly, dark matter shapes the cosmos from behind the veil of visibility.

Table -1: Vedic Conceptual Parallels to Dark Matter

MODERN CONCEPT	VEDIC EQUIVALENT	KEY FEATURES
Dark Matter	Avyakta / Prakriti / Tamas	Invisible, mass-generating, structure-forming
Gravitational Binding	Gravitational Binding	Pulls inward, cohesive, unobservable
Invisible Realms	Lokas / Maya / Sukshma Sharir	Subtle, layered, causative of visible reality |
Origin of Dark Matter	Unmanifest Prakriti via Maya	Precedes form, veiled by illusion

9. CONCLUSION

While ancient Vedic seers did not engage in empirical cosmology, their insights into reality's unseen layers offer profound metaphysical frameworks that align symbolically with modern concepts like dark matter. Through Avyakta, Maya, and Akasha, the Vedas emphasize that the visible world arises from invisible, subtle causes—a vision that mirrors the contemporary scientific acknowledgment of an unseen but gravitationally potent dark cosmos. A symbolic and philosophical interpretation rather than a literal one allows us to see Vedic thought as a complementary lens to probe the unknown aspects of the cosmos.

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