International Research Journal of Pure and Applied Physics
Vol.5, No.3, pp.1-4, August 2017
Published by European Centre for Research Training and Development UK (www.eajournals.org)

DUALITY OF DARK MATTER - WHAT'S NEXT FOR DARK MATTER THEORY?

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ABSTRACT: *This paper is an overview of dark matter duality theory of space-time in 4-d, with some constructive criticism regarding hypothetical candidate selection and where dark matter experimental physics could benefit from better understandings and timely review of cosmological finding. This paper is part of a collection called the Grand Unification of Dark Matters: The Dark Universe Revealed.*

KEYWORDS: Dark Matter, Dark Energy, Duality, Duality Theory, Cosmology

INTRODUCTION

Overview

With experimental physics, why are we taking decades to rule out supersymmetry dark matter candidates, that don't even need to show up in 4-d space-time, instead of drawing candidates from cosmological observations and simulations, such as those done at UC Irvine, which often resembles similar halo profiles as cold dark matter (CDM), but solves larger than predicted elastic cross section problems, which could be the right size if dark matter is composite? [1]

Some models, like WIMPs and Axions have been ruled out for the most part, but it has taken 30 years. The WIMP had already been ruled out several years earlier based on cosmological finding. Axions are still being looked at by academics.

Meanwhile, there all kinds of astrophysics theories with significant inconsistencies and contradictions, that nobody can make any headway on, such as the Cosmological Constant Problem and the Hierarchy Problem, holding up who knows how many scientists, who could otherwise be making huge advancements, once this is all better understood, at a cost that must be staggering, and that doesn't even include the mediocre healthcare side of the problem that nobody even recognizes, which is going to be huge for medical science.

The thing is, this isn't even that complicated, it's just a "duality" in space-time between ordinary matter and dark matter that also explains most dark energy.

Although this is similar to a pseudo 5th dimension or even a shadow 5^{th} dimension, it's all happening in the 4th dimension that can more easily relate to.

ISSN 2055-009X(Print), ISSN 2055-0103(Online)

I've written several scientific papers on the duality of the 4th dimension of what we consider space-time, including properties and proposed experiments, some are available online, the full collection is at The Grand Unification of Dark Matters: The Dark Universe Revealed: Dan Sharpe: 9781520306315: Amazon.com: Books

Dark matter physics and theory is a work in progress, like a mystery to be solved as more clues occasionally show up, so the experimental physics teams really need to be more adaptive.

For the first time, quantum gas in a laboratory has been demonstrated to "defy" gravity at sub-absolute temperatures. Therefore, "composite" dark matter gasses could explain most dark energy. [2]

Observable dark matter is missing from the formation of young galaxies and becomes very much observable with more mature galaxies, which could be regulated by temperature increases over time, making dark matter slow to respond to temperature increases and making gravity dynamic and weaker in younger galaxies than is generally accepted. [3]

The Big Bang theory predicts that the early universe was hot and as it expands, the gas cools. The measurable temperature of the universe today is about 2.73 kelvins (−270.42 °C; −454.76 °F), where as recently as several billion years ago, the temperature was closer to 5.08 kelvins. This observation was made using light passing through a gaseous galaxy. [4]

Although ordinary matter "should" never naturally drop to sub-absolute temperatures because of friction, it is theoretically possible for dark matter to do so, making it challenging to determine the ambient temperature of deep space, with virtually no electromagnetic signature at low temperatures, but further research on temperature and cold thermodynamics could greatly increase our understand of dark energy, dark matter and even gravity.

Dark Matter is simply "transparent matter" that does not emit, absorb or reflect light, or other electromagnetic radiation (that we can detect), is observed by its gravitational influence around galaxies (halos) and its effects on visible matter, radiation, and large-scale structures of the universe, but it is right here on Earth all around us, so it is just a matter of isolating it.

Democritus, a Greek philosopher from the 5th century BC, come up with the first quantum theory describing "atomos", as he called atoms, which were specific to the material that they composed, could have collisions, rebound or stick together, so dissociations or combinations of these atoms could result in changes in matter.

ISSN 2055-009X(Print), ISSN 2055-0103(Online)

Cosmic energy goes back as much as the 17th century BC in the written record, but who knows how far back that mankind has recognized this primal and essential energy of the universe for health, vitality and longevity.

Other cultural terms include Hindu Prana, Apana and Yyana, Chinese Chi (Qi), Vietnamese Khi, Korean Gi, Japanese Ki, subtle energy and woo energy, Hebrew koach-ha-guf, Greek Bios, English Aether, American Indians Orenda, Polynesian Mana, and Ancient Germans Od which are believed to be a part of any living thing, translating to breath, air, gas, or life force that permeates the universe.

Let's face it, cosmic energy is well-substantiated in the historic and cultural records, where the leading hypothetical dark matter candidate, the Weakly Interacting Massive Particle (WIMP) has had a 30 year run now, largely because it came out of String Theory and Supersymmetry, with countless experimental results yielding NOTHING!

Meanwhile, there is overwhelming cosmological evidence of dark matter indicators on larger scales, with simulations and models for various hypothetical candidates that need to be ruled out. New technologies, such as the GalICS 2.0, are making it easier to predict how star formation and stellar formation takes place, strengthening the case that dark matter does exist. [5]

Dark matter as a composite "transparent matter", perhaps with a different quantum phase, is a serious contender.

Even so, the only conclusive proof of dark matter will come from "direct-detect" experiments to isolate these particle(s). Although detector technologies are improving, ruling out candidates similar to WIMP's, such as "leptophic" models that predicts interactions between electrons and dark matter, could be a very long road, because the result will always be inconclusive; expecting to observe light from collisions assumes we have a grasp on the fundamentals of dark matter physics, or even the type of energy produced by collisions, which is surely not going to be photons.

Since the world's two most sensitive direct-detect experiments, the LUX and PandaX-II have recently failed in their quest for dark matter particles; there probably isn't a consensus for a favored dark matter model at this point. [6]

Let's hope it doesn't take another 30 years to discover something that a very large percentage of our population is already aware of on some level, the WIMP contender, "Composite Dark Matter" also known as "Cosmic Energy", has already been known about for centuries.

The Dark Matter Day Is Approaching … but Don't Be Afraid of the Dark … This Halloween worldwide local and online events are being organized to celebrate the hunt for dark matter, with public discussions about dark matter, and about the many experiments that seek to solve its mysteries.

Maybe it's time we all start asking more loaded questions, instead of waiting for any real answers!

The top 5 list of candidates as of two years ago:

ISSN 2055-009X(Print), ISSN 2055-0103(Online)

1) The WIMP hypothetical particle coming out of supersymmetry, with 100,000 of these passing through every square centimeter each second, has recently been ruled out by the most sensitive direct-detect experiments in the world, the LUX and PandaX-II.

2) The axion which also came out of out of supersymmetry has been ruled out, except for some recent academic experiments.

3) The MACHO, massive astrophysical compact halo object, which at best could only account for a small percent of dark matter.

4) The Kaluza-Klein particle, built around the existence of a 5th dimension, which could interact with both gravity and electromagnetism, based on a precursor to string theory.

5) The gravitino, yet another hypothetical candidate coming out of supersymmetry, thought to mediate gravity, largely because some scientists want to determine if nature is supersymmetric or not, with symmetry between matter and forces, such as the theoretical graviton and the gravitino, so dark matter is secondary, and ordinary matter is more practical to work with.

REFERENCES

James Bullock (2015) Dark Matter May Be More Complex Than Physicists Thought Available: https://www.wired.com/2015/08/dark-matter-may-complex-physicists-thought/

Jodi A. Cooley (2017) Viewpoint: Dark Matter Still at Large. Physics *[Online] Available: https://physics.aps.org/articles/v10/3*

John Timmer (2017) Dark Matter is missing from young galaxies Online: https://arstechnica.com/science/2017/03/dark-matter-is-missing-from-young-galaxies/

S. Muller (2012) Astronomers Measure the Temperature of the Universe 7.2 Billion Years Ago. Online: https://scitechdaily.com/astronomers-measure-the-temperature-of-the-universe-7-2-billion-years-ago/

Seigle, Ethan (2017) Dark Matter Theory Triumphs In Sweeping New Study, Forbes, [Online] Available: https://www.forbes.com/sites/startswithabang/2017/06/29/dark-matter-theory-triumphs-in-sweeping-new-study/#1089023152d8

Zeeya Merali (2013) Quantum gas goes below absolute zero, Available: http://www.nature.com/news/quantum-gas-goes-below-absolute-zero-1.12146

ISSN 2055-009X(Print), ISSN 2055-0103(Online)