ISSN: 2639-0108

Research Article

Advances in Theoretical & Computational Physics

Essay on Calculating Dark Energy and Dark Matter

Friedhelm M. Jöge*

Independent scientist, Germany

*Corresponding Author
Friedhelm M. Jöge, Independent scientist, Germany.

Submitted: 2024, Oct 24; **Accepted:** 2024, Nov 27; **Published:** 2024, Dec 05

Citation: Jöge, F. M. (2024). Essay on Calculating Dark Energy and Dark Matter. *Adv Theo Comp Phy, 7*(4), 01-02.

Abstract

A formula for calculating dark energy is established through derivation. The result is tested on the basis of the available data from the MAX PLANCK Institute for Radio Astronomy. In International Journal of Physics and Astronomy June 2019, Vol.7, No.1, pp.1-7 additional formulas are substracted. The universe's dark matter has been computed. There is a balance sheet created and the most important formulas compiled.

Keywords: Dark Energy, Dark Matter, Calculation, PLANCK Time, Age of the Universe, Cosmic Information

Definition of Symbols Used In Formulas

E = energy
t_u = age of the universe
t_p = PLANCK time
ν = frequency
h = PLANCK quantum of action

Summary

The rudiments of a theory of dark energy. The theoretical result is confronted with the numerical value calculated from the available data. Excellent matching of numerical values resulting in three independent paths makes the approach plausible. The approach is credible because of the excellent matching of numerical values that produces three separate routes. The task at hand is comparable to Kepler's planetary orbital rules. Only Isaac Newton gave Kepler's laws a theoretical foundation, which Thomass Görnitz provides here. Niels Bohr, who computed the energy levels of the hydrogen atom and the frequences of spectral lines, theoretically supported the empirical Balmer formula for the spectral line frequencies in the arc spectrum of the hydrogen atom.

A mysterious element known as dark energy is theorised to accelerate the universe's expansion by repelling matter. Theorists have proposed a variety of methods to calculate dark energy over the years. Numerous theories, however, fail to apply a metric structure to gravity or energy momentum conservation even when they satisfy strict local tests. The most popular option for dark energy is the cosmological constant, often known as vacuum energy density.

By its very nature, dark energy is a low-energy phenomenon that is dispersed. It is not present in galaxies or galaxies in clusters, and it is probably unlikely to be found in laboratory research. The repellent dark energy that hastens the universe's expansion could be explained if the cosmological constant is the vacuum energy of space. Nobody, however, is aware of the cosmological constant's existence or the amount that might be assigned to it in order to calculate the universe's acceleration.

Any two matter fields can interact with each other in particle physics or on a more theoretical level, according to a possible process called the interaction of dark matter and dark energy. The phenomenological theory in question has aroused the interest of the cosmology community for a number of reasons. As in the interaction model, where dark energy decays into dark matter, interacting models of DM and DE are an equivalent description of the dark sector of the Universe that have undergone extensive research and are motivated by a viable explanation to the so-called coincidence and cosmological constant concerns.

1. Introduction

Dark energy is a mysterious energy. Nobody knows what dark energy actually is. Dark energy and dark matter cannot be observed directly. It is thought to be responsible for the accelerated expansion of the universe. Dark energy is, by this nature, a low-energy phenomenon that is dispersed. It is not found in galaxies or galaxy clusters and is unlikely to be found in laboratory studies.

The repulsive dark energy that accelerated the expansion of the universe could be explained if the cosmological constand is the vacuum enery of space. Some considerations have been made; however, they have not yet produced fruitful results to date. In particular, it was not possible to carry out an exact calculation of dark energy. With the present formula, this goal has probably been achieved.

2. Derivation of a Formula for Calculating Dark Energy

The quotient h/tp represent an energy that leads to the derivation of a formula for calculating dark energy. This requires only the assumptions that the PLANCK time tp is an oscillation period τ and dark energy satisfies the PLANCK / EINSTEIN formula

$$E = h \nu \qquad (1)$$

Qscillations are fundamental oscillations of the cosmic space [1, pg.15]. THOMAS GÖRNITZ says: “Structural quanta emerge from a quantum-theoretical description of “oscillation states” of a system around its ground state. They produce many effects. The AQIs of protyposis are also structural quanta and not particles. One can interpret them as the *fundamental oscillations of the cosmic space”.*

For dark energy Ed this then leads to:

${}_pE_d = h / t_p = 1.229 \cdot 10^{10}$ J in PLANCK time
${}_1E_d = 2.28 \cdot 10^{53}$ J in 1 s

$\underline{E_d = 0.994 \cdot 10^{71}\text{ J}}$ in 13.8 billion years for the age of the universe
$t_u = 4.358 \cdot 10^{17}$ s

The following formula for calculating dark energy in the universe is then derived from these calculation steps:

$$E_d = h\, t_u / t_p^{\,2} \qquad (2)$$

This simple three-sentence operation was supports by THOMAS GÖRNITZ [1] in a more in depht manner, resulting in very well-matched numerical values. A connection to the empirical is thus achieved. Data shows us the nature of things as well as theories.

Formula (2) can be extended to formulate the general Equivalence of Energy and Time:

$$E = (h / t_p^{\,2}) \cdot t\ [2] \qquad (3)$$

3. Conclusions

PLANCK time can be understood as oscillation period. Oscillations are fundamental oscillations of the cosmic space, dark energy satisfies the Planck/Einstein formula. Dark energy can be interpreted as information flow. The cosmic information multiplied by ln2 is nothing more than the age of the universe in Planck time units squared. The surface of a spherical universe would still have room for the roughly sixefold portion of the cosmos's entire known information content. Dark matter corresponds to the number of protyposis (AQIs) in the cosmos. The informational equivalents of dark matter and the total mass energy of the cosmos are in a ratio 1/4. Dark energy and dark matter are in a ratio 2/ln2. The ratio of dark energy to the total mass energy of the cosmos is ln2. Half of the hypothetical particles of dark matter are distributed over the black holes in the universe and can be made accessible after the experimental production of small black holes in a particle accelerator.

References

1. T. Görnitz, T. (2017). Quantum cosmology explains “dark matter” as well as the structure of interactions and makes “dark energy” superfluous.
2. Jöge, F. M. (2022). Equivalence of Energy and Time. *International Journal of Physics, 10*(1), 1-2.
3. Jöge, F. M. (2022). Equivalence of Information flow and Time. *OSP Journal of Physics and Astronomy, 3*(3), 1-2.
4. Jöge, F. M. (2019). Calculation of Dark Energy and Dark Matter. *International journal of Physics and Astronomy, 7*(1), 1-7.
5. Jöge, F. M. (2023). Information & Effect: An Introduction to the Concept of Immanence as a Physical Quantity. *Journal of Modern and Applied Physics, 6*(2), 1-6.
6. Jöge, F. M. (2024). Equivalence of Information and Effect. *European Journal of Applied Sciences*, 12, 1.
7. Jöge, F. M. (2024). Time is Energy and Dynamic Information. *Adv Theo Comp Phy, 7*(3), 01-02.
8. Jöge, F. (2024). Equivalence of Information and Squered Time. *Applied Sciences Research Periodicals, 2*(10), 16-17.
9. Lyre, H. (1997). Time and Information. In: Atmanspacher, H., Ruhnau, E. (eds) Time, Temporality, Now. Springer, Berlin, Heidelberg.
10. Hussainsha, Syed. (2016). Theory of Time: Time is Energy and Future.
11. Kinseher, R. (2016). Das Wesen von Zeit ist Energie: *Materialkunde.* BoD–Books on Demand.
12. Sedlacek, K. D. (2010). Äquivalenz von Information und Energie. *Norderstedt: Books on Demand GmbH Verlag.*
13. Tribus, M., & McIrvine, E. C. (1971). Energy and information. *Scientific American, 225*(3), 179-190.
14. Arnott, R., De Palma, A., & Lindsey, R. (1999). Information and time-of-usage decisions in the bottleneck model with stochastic capacity and demand. *European Economic Review, 43*(3), 525-548.