DOI: https://doi.org/10.24297/jap.v20i.9223

Creator of the Universe Adjusted the Dark Energy/Dark Matter Ratio and Baryons to be Function In π and eπ: Predicted and Deciphered by Sayeed's Theorem

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Abstract

The fine tuning of the universe was adjusted by Allah – the Creator. This article deciphered the dark energy (DE), dark matter (DM) and baryonic matter (BM) pattern ambiguity as a one of the physics mysteries. In this article and for the first time, the ratio of the dark energy/dark matter and baryons are predicted by Sayed`s theorem to be function in π and eπ. The previous published measurements and estimations have been showing different values and variations. It is predicted that the ideal and optimum (DE/DM) ratio is equal to the constant π; called Sayed El-mongy (DE/DM) ratio; symbolized as ($\mathbf{s^{AM}}$)**.** While, the ratio (DE/DM+BM) is to the constant e. The value of (DE/DM) multiplied by (DE/DM+BM) was found to be eπ. The typical predicted values of dark energy, dark matter and baryons are 71.314093%, 22.7% and 3.538% respectively. The remainder 2.450907% could be due to undiscovered and any other form of matter (OM) including neutrinos and antimatter. The comparison of the predicted values with the world range and published data was also carried out and given with the % discrepancy. It was observed that the closest values to the predicted **(DE/DM) Sayed ratio (π)** are with the difference of 0.35508198% for SWIN and 1.02083609% for WAMP respectively.

Keywords: Dark matter/Dark energy ratio, Baryons, the universe, π and eπ correlation, Sayed`s theorem.

I. Introduction

In general, fine-tune is to adjust precisely so as to bring to the highest level of performance and effectiveness. As a matter of fact, there are tens and may be hundreds of unresolved mysteries in physics waiting for solutions, interpretation and discoveries. Dark energy and matter are among those hot topics. The dark energy is a hypothetical form of energy that exerts a negative, repulsive pressure, behaving like the opposite of gravity (1,2). Dark matter is a type of matter hypothesized in astronomy and cosmology to account for a large part of the mass that appears to be missing from the universe. Dark matter cannot be seen directly with telescopes; evidently it neither emits nor absorbs light or other electromagnetic radiation at any significant level (3). An observations made by Edwin Hubble in 1929 showed that the universe appears to be expanding and not static at all as given by general relativity of Einstein; his big blunder. Dark matter is not antimatter, because we do not see the unique gamma rays that are produced when antimatter annihilates with matter (4). Hubble Data suggests there is an ingredient missing from current dark matter theories, 2020 (4). Figure 1 shows presentation of dark energy and expansion of the universe which was also mentioned in the holy Quran by Prophet Mohamed 1443 years ago.

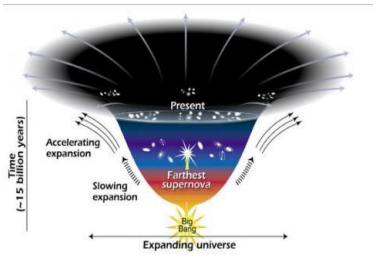


Fig. 1: Universe Dark Energy- Expanding Universe (4)

The cosmological constant, expansion rate of the universe and Hawking`s radiation is nothing are precisely calculated and given by published Sayed`s acceleration equation (5) The correlation of eπ with arc length of circle, sphere volume, enrichment percentage and many other nuclear and scientific applications are also published using Sayed`s El mongy theorem (6,7,8,9,10).

This article **predicts** and decipher the fine adjusting of the dark energy, dark matter, baryonic (observable) matter and undiscovered matter in the universe as functions in π , e and eπ based on Sayed`s theorem.

II. Dark Energy- Dark and Baryonic Matter Literature

- The term "dark energy", echoing Fritz Zwicky's "dark matter" from the 1930s, was coined by Michael Turner in 1998 (1,3).
- Dark matter can be divided into cold, warm, and hot (The neutrino qualifies as such particle) categories. These categories refer to velocity rather than an actual temperature, indicating how far corresponding objects moved due to random motions in the early universe, before they slowed due to cosmic expansion – this is an important distance called the free streaming length (FSL) (11)
- The first direct evidence for dark energy came from supernova observations in 1998 of accelerated expansion in Riess *et al.* and in Perlmutter *et al.*,. The two teams used eight telescopes including those of the Keck Observatory and the MMT Observatory Type Ia supernovas that exploded when the universe was only two-thirds of its present size were fainter and thus farther away than they would be in a universe without dark energy. This implied the expansion rate of the universe is faster now than it was in the past. Figure 2 shows matter-energy content of the universe (12).

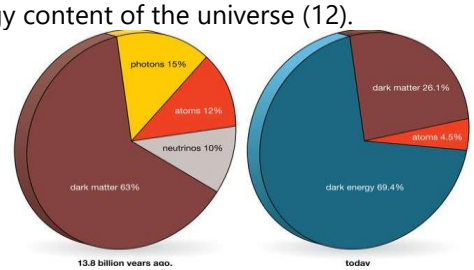


Fig. 2: Matter-Energy Content of the Universe

- It turns out that roughly 68% of the universe is dark energy. Dark matter makes up about 27%. The rest - everything on Earth, everything ever observed with all of our instruments, all normal matter - adds up to less than 5% of the universe (4). The value of 69, 26 and 5 for DE, DM and BM was also given by NASA (4).
- Measurements (Fig.3) from Planck put baryonic matter at about 4% , dark matter at 23% and dark energy making up the remainder at 73 % (3).

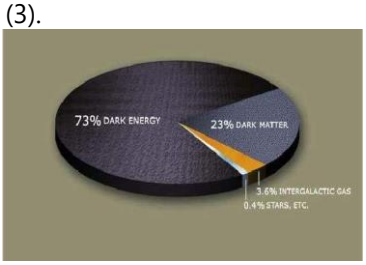


Fig. 3: Percentage of dark energy and matter and baryons

- Work done in 2013 based on the Planck spacecraft observations of the CMB gave a more accurate estimate of 68.3% dark energy, 26.8% dark matter, and 4.9% ordinary matter, the next figure 4 (11).

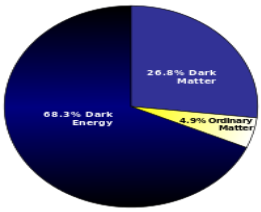


Fig. 4: The distribution of dark energy and matter in the universe

- Recent observations of supernovae are consistent with a universe made up 71.3% of dark energy and 27.4% of a combination of dark matter and baryonic matter (11).

- The latest measurement from the Plank mission suggests the cosmos is made of roughly 68% of this dark energy, along with 5% ordinary matter and 27% dark matter. However, the exact nature of dark energy remains mysterious (13**)**
- The rest of the universe appears to be made of a mysterious, invisible substance called dark matter 25 % and a force that repels gravity known as dark energy 70 % (14)**.**
- The present Constitution of the Universe according to the **Λ CDM** model shows different value of Dark Energy, Dark Matter and Baryons as 71.4 , 24 and 4.6 respectively (15**)**
- The Wilkinson Microwave Anisotropy Probe (**WMAP**) spacecraft seven-year analysis estimated a universe made up of 72.8% dark energy, 22.7% dark matter, and 4.5% ordinary matter. The distribution of the dark energy, dark matter and baryons at the beginning of the universe and recently is also given in the next figure 5 (4,16).

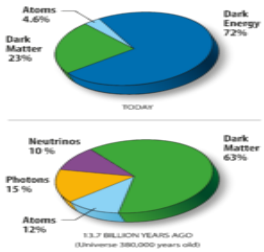


Fig. 5: The distribution of dark energy and matter and baryon in the universe

- According to ΛCDM model, the main components of our universe are Dark Energy (Lambda, Λ) and Cold Dark Matter (CDM), with regular matter in a distant, third position. The widely accepted values for each component are**:** Dark Energy Ω_Λ: 69.1 % or 0.691, Matter Ω_m: 30.89 % or 0.3089 and Radiation/Light Ω_r: 0.00824 % or $8.24 \cdot 10^{-5}$ **(**17**)**
- The next pie figure 6 shows the values of 72 , 23 and 4.6 for DE,DM and BM respectively (2,18).

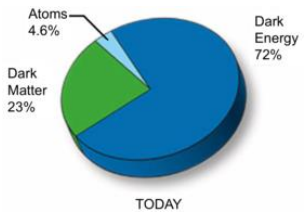


Fig.6: Schematic representation of the total mass energy density in the universe

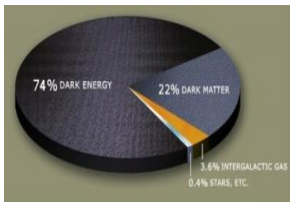
- Other values 74, 22, 3.6 and .0.4 are given as shown in the next figure 7 (19).
- 

Fig. 7: The distribution of dark energy and matter and baryons in the universe

- Most of the universe is invisible stuff called "nonbaryonic dark matter" (25%) and "dark energy" (70%). Everything that we can see makes up only about 1/2% of the cosmic density, and invisible atoms about 4%. The earth and its inhabitants are made of the rarest stuff of all: heavy elements (0.01%). (20,21**).**
- One of the references shows the following percentages as given in figure 8 (22).

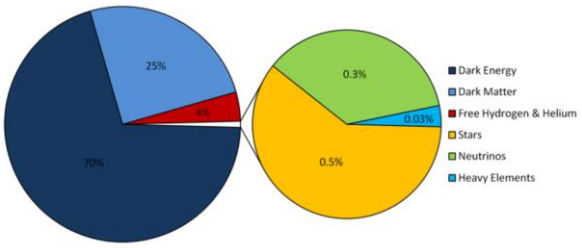


Fig. 8: The dark energy , dark matter and other form of matter in the universe

- Anther work gives different values for DE,DM and BM as in the following figure 9 (23)

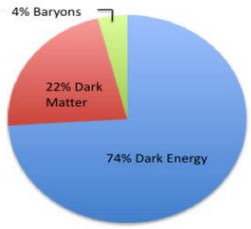


Fig. 9: Distribution of DE, DM and BM in the universe

- Don Lincoln "Colloquially, we can say that energy can convert into matter and back again. However, that statement is a little incomplete. It is more accurate to say that energy can convert into equal amounts of matter and antimatter. (24**)**.
- Dark matter could be made of fundamental and exotic particles that are yet to be discovered. Alternatively, it could consist of many massive and compact objects, such as primordial black holes **(**25**)**
- The new estimate of dark matter content in the universe is 26.8 percent, up from 24 percent, while dark energy falls to 68.3 percent, down from 71.4 percent. Normal matter now is 4.9 percent, up from 4.6 percent (26).
- Ordinary matter makes up only about 5% of the universe. Dark energy, which cosmologists hypothesize, drives the accelerating expansion of the universe by counteracting the force of gravity, accounts for about 70%. The last 25% is dark matter, whose gravitational influence binds galaxies together (27).
- The values of 72.8, 22.7 , 4.53% of DE, DM and BM were also given by another reference (28)
- The range; 68-70 , 25-27 and <5 for DE, DM and BM was also reported in other work (29**)**
- The reference (30) indicates the values 70, 25, and 5% for DE , DM and BM respectively.
- A team of astronomers using NASA's Hubble Space Telescope has measured the universe's expansion rate using a technique that is completely independent of any previous method. Unraveling this mystery has been one of the greatest challenges in astrophysics in recent years. The new study adds evidence to the idea that new theories may be needed to explain what scientists are finding (31).
- A unique approach for the universe expansion calculation is given in the reference number (5) by Sayed El-mongy acceleration equation.
- A large galaxy survey releases its three-year observations, providing key cosmological-parameter measurements that have double the precision of those previously released (32).

III. Equations of Predication of Dark Energy/Dark Matter Ratio and Baryons:

As space expands, the dark energy density remains constant, rather than decreasing or increasing. The ratio of dark energy/dark matter (DE/DM) is simply expressed based on Sayed El mongy theorem as follows (5,6,7,8,9,10):

(DE/DM) = π **(1)**

Where, **π** is the irrational constant (circle`s circumference/its diameter) equals to 3.14159 (7). This ratio; the term **π,** is called Sayed El-mongy (Dark energy/ dark matter) ratio. Taking into consideration the baryonic (observed) matter (BM), another ratio can be obtained as;

(DE/DM+BM) = e **(2)**

The ratio (DE/DM+BM) equals to **e**. Where, e is the base of natural logarithm; 2.71828 (7).

The term **eπ** is produced by multiplying equation1 in 2, as follow;

(DE/DM) x (DE/DM+BM) = eπ **(3)**

The equation 3 can be rewritten as;

$(DE)^2$/ {$(DM)^2$ + (DM.BM)}= eπ **(4)**

Equation 4 can also be rewritten as;

$(DE)^2$/$(DM)^2$.(1+BM/DM)}= eπ **(5)**

Dividing equation 1 on 2, and 2 on 1, one gets the following two expressions;

(DE/DM) / (DE/DM+BM) = π/e **(6)**

This equation can be rewritten and given as;

{1 + BM/DM } = π/e **(7)**

(DE/DM+BM)/ (DE/DM)= e/π **(8)**

This equation can also be given as;

{1/ (1+ BM/DM)} = e/π **(9)**

The ratios of π/e and e/π values are typically 1.155727151 and 0.865256128 respectively

IV. Results of the Predicted Values Compared with Published Percentages

The typical predicted values of dark energy, dark matter and baryonic matter and the world range are summarized in the following Table 1 (7,8,10,25).

Table 1: The Predicted Dark Energy, Dark Matter and Baryons as Functions in π, e and eπ

Item	**Abbreviation**	**World Range NASA (25)**	**Predicted Values by Sayed`s Theorem***
Dark energy	DE	68.3 – 71.4	71.314093
Dark matter	DM	24 - 26.5	22.7
Baryonic matter	BM	4.6 – 4.9	3.538
Other including antimatter	OM	---	2.450907
Total matter	TM (BM+OM)	---	5.988907
(DE/DM) ratio	Π	---	3.14159
(DE/DM+BM) ratio	E	---	2.7182800
(DE/DM) x (DE/DM+BM)	Eπ	---	8.539721265
(DE/DM) / (DE/DM+BM)	π/e	---	1.155727151
(DE/DM+BM)/ (DE/DM)	e/π	---	0.865256128

- **π** is 3.14 in decimal and (22/7) in fraction. It is irrational number which means that the digits after the decimal point are never –ended and being a non-terminating value.

It can be observed from table 1 that the predicted Dark Energy (DE) is within the world range. While, the dark matter (DM) and Baryons (BM) are slightly lower and higher than the given range. It can also be mentioned that another type of matter is expected to be undiscovered.

As given in figure 8, there are 70% Dark energy, 25 Dark matter, 4% free hydrogen and helium , 0.5 stars , 0.3 neutrinos and 0.03 heavy elements (22). The following equation predicts the value of the other forms of matter (OM) including neutrino and antimatter;

DE/[(DM+BM+OM)] **(10)**

DE/[(DM+TM)] **(11)**

The other matter (OM) rather than dark matter is expected and given by;

OM = DE/ {(DM/OM + BM/OM + 1)} **(12)**

Comparison of Wilkinson Microwave Anisotropy Probe (WMAP) measurements and estimation (16) with the predicted values is given in the following Table 2.

Table 2: The Predicted Dark Energy/Dark Matter Ratio and Baryons as Function in π and eπ

Item	**Symbol**	**Published WMAP (16)**	**Predicted by Sayed`s theorem***	**% Discrepancy**
Dark energy	DE	72 8%	71.314093	2.0836092
Dark matter	DM	22.7%	22.7	-----
Baryonic matter	BM	4.5%	3.538	27.298444
Other including antimatter	OM	---	2.450907	------
Total matter	TM(BM+OM)	----	5.988907	-----
(DE/DM) ratio	π	3.207048458	3.14159	1.02083609
(DE/DM+BM) ratio	e	2.676470588	2.7182800	0.98461916
(DE/DM) x (DE/DM+BM)	eπ	8.58357087	8.539721265	0.51348107
(DE/DM) / (DE/DM+BM)	π/e	1.198237886	1.155727151	1.036782675
(DE/DM+BM)/ (DE/DM)	e/π	0.83455882	0.865256128	0.96452229

It can be observed that the % discrepancy between the estimated DE/DM ratio and the predicted by Sayed`s theorem is 1.02083609%.

Table 3 shows the comparison of published values of dark energy,-dark matter and baryonic matter with the predicted values as function in **π, e** and **eπ** (**2).**

Table 3: The Predicted Dark Energy/Dark Matter Ratio and Baryons as Function in π and eπ

Item	**Symbol**	**Published work (2)**	**Predicted by Sayed`s theorem**	**% Discrepancy**
Dark energy	DE	72%	71.314093	0.96181129
Dark matter	DM	23%	22.7	1.3215859
Baryonic matter	BM	4.6%	3.538	30.127298
Other including antimatter	OM	---	2.450907	-----
Total matter	TM(BM+OM)	----	5.988907	-----
(DE/DM) ratio	π	3.13043478	3.14159	0.35508198
(DE/DM+BM) ratio	e	2.60869565	2.7182800	0.95975012
(DE/DM) x (DE/DM+BM)	eπ	8.166351593	8.539721265	4.372152912

(DE/DM) / (DE/DM+BM)	π/e	1.2	1.155727151	3.830735481
(DE/DM+BM)/(DE/DM)	e/π	0.833333333	0.865256128	3.689404093

The % discrepancy of the predicted DE/DM ratio as shown in table 3 and the published one is only 0.35508198%. Based on the predicted values as given by Sayed`s theorem, it might be stated that the mystery of DE/DM ratio in the universe has been deciphered an unraveled.

Conclusion

This article predicts that the fine tuning and the ideal ratio of dark energy to dark matter ratio in the universe is correlated and equal to the constant **π**; 3.14159. By revision of the most published measured and calculated values, it can be stated that the predicted optimum ratios of dark energy, dark matter and baryons are 3.14159, 2.71828, 8.539721265, 1.155727151 and 0.865256128 corresponding to **π**, **e**, **eπ, π/e** and **e/π** respectively. The term **eπ** (8.539721265) is defined as Dark energy/dark and baryonic matter Sayed`s El-mongy constant. Based on the predicted values as given by Sayed`s theorem, it might be stated that the mystery of DE/DM ratio in the universe has been deciphered and unraveled.

Acknowledgment

I am proud that you are Allah, the creator of the very fine-tuned universe and everything including my soul and myself.

Conflict of interest

There are no any conflict of interest with anybody or authority dealing with this topic.

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Biography

Prof. Sayed Ali El-mongy headed Egypt nuclear regulatory authority, department of nuclear safeguards and Division for regulations and nuclear emergency. He participated as a delegation member in NATO, IAEA and IRRS mission. He contributed the community with many TV shows and newspaper articles. He has a publication merged classic mechanics, relativity and quantum field theory with probable violation of $E=mc^{2.}$ He has also publications in the field of nuclear, environmental, safeguards and black hole theory titled Hawking radiation is Nothing., He is currently a scientific supervisor and nuclear affairs consultant.