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Short Article

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# About the Percentage Composition of the Energies of the Universe, Provided by the MAX PLANCK Institute for Radio Astronomy

## Exact Calculation of the Value of the HUBBLE's Constant

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**Abstract**

*Formula (a), which is made up two formulas, show the connection between the PLANCK time and the HUBBLE's constant. When converted, it enables the exact calculation of the value of the HUBBLE's constant, which was previously obtained from astronomical measurements, and thus represents, a concrete application of formula (a).*

**Keywords:** Energies, Universe, Calculation, Percentage Composition, Value, Constants

### 1. Definition of Symbols Used in Formulas

$E_M$ = visible baryonic matter
$E_d$ = dark energy
$H_0$ = HUBBLE's constant
$m_p$ = proton mass
$m_e$ = electon mass
$\dot{\alpha}$ = Fine structure constant of gravity
G = constant of gravitation
c= speed of light
h = PLANCK's quantum of action
t = time
$t_u$ = age of the universe
$t_p$ = PLANCK time

**The data from the MAX PLANCK Institute for Radio Astronomy is the basis. The mass / energy of the universe is composed as follows:**

70 % dark energy
25 % dark matter
4-5 % visible baryonic matter
0.3 % neutrinos

### 2. Derivation of the Formula (1)

In my article “Calculation of Dark Energy and Dark Matter” [1] the formula (2.1) is derived:

$E_M = c^5 / (8^{1/2} G H_0) = 5.61 \cdot !0^{69} J$ (2.1) (1)

In my article “Equivalence of Energy and Time” [2] the formula (2) is derived:

$E_d = (h/t_p^2) \cdot t_u$ (2)

By combining formula (1) and (2) you get:

$t_p^2 = (8^{1/2} \cdot hG \cdot H_0) / c^5$ (a)

Through change you get:

$H_0 = t_p^2 \cdot c^5 / (8^{1/2} \cdot hG)$ (b)

The theoretical derivation of the value for the HUBBLE's constant can be formulated as follows:

$H_0 = (G m_p^2 \cdot m_e c) / 8 \acute{\alpha} h^2$ (3)

## 3. Conclusion

A new formula (a) is discovered. Perhaps she can support the idea of Valentyn Nastasenko, Ukraine, in his article “Energy of the Gravitational Field as an Equivalent of the Dark Energy of the Universe” [3] is expressed. The combination of Quantum Field Theory (QFT) and General Theory of Relativity (ART) developed by ALBERT EINSTEIN could also support what Professor Alexandre Tkatchenko from the University Luxemburg says [4].

## 4. Application

The new formula (a) can be used for the exact calculation of the value of the HUBBLE's constant - see formula (b) - and thus support astronomical measurements. The formula (b) can also be compared with the value known and derived from the literure.

## References


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