

Calculate Universe 4 – Minimalistic Approach

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No problem can be solved from the same level of consciousness that created it¹, Albert Einstein

Introduction

This paper arose from well-known principles, as well as from approaches that reject imposed norms – norms I saw as hindering the solution.

The paper contains no **keywords** or an **abstract** – because these are previous papers titled *Calculate Universe* [1–3]; I was certain 13 years ago they led to the goal in the title.

The paper is *minimalist*; it does not provide an exposition of any of the covered fields, but only shows one dimensionless formula from each field, with many from previous works behind it. Moreover, it does not contain parameters related to the universe as a whole (mass, radius, and time), as they are no longer necessary – the mutual relations among parameters suffice.

Moreover, I am not competent to give those expositions, which would follow from just two assumptions (published in [4] three years after the papers that had already used them); only these assumptions matter, the formulas being merely a means for their acceptance or refutation.

Furthermore, the paper does not need to contain any other references except Ruder Bošković's *Theory of Natural Philosophy* [5], which anyone who has attempted to address the topic of the title should know. It also does not contain verifications or explanations, because anyone can derive them by checking the expressions that will be presented here.

This work, born from a retired meteorologist's solitary play – not from a career scientist – is free from established norms, closer to Einstein's spirit. Relying solely on meteorological data processing, it aims to show that the same concept yields results across very different scientific fields, thereby demonstrating its universality.

At the very outset, we will give two mathematical and physical constants, together with derived from them, which will serve to shorten the writing. All formulas are based on the constants and exemplify the concept. We obtain Formulas With accuracy within experimental uncertainties. They are dimensionless for verification in any unit system. Conventional symbols are used; absolute values are omitted because only dimensionless ratios matter. Second- and third-generation quarks are denoted by their English initials (*t*, *b*, *c*, *s*). Different dimensionless constants are always denoted by *x*, each used once per formula.

¹ <https://www.jagranjosh.com/general-knowledge/albert-einstein-quotes-1698299107-1>

Constants	<i>Mathematical:</i>
2π	6.28318531
$e^{2\pi}$	535.4916555
<i>Physical:</i>	
Inverse fine-structure constant α^{-1}	137.035999084
fine-structure constant α	0.00729735257
proton-to-electron mass ratio μ	1836.15267343
neutron-to-proton mass ratio γ	1.00137841920
speed of light c	2.99792458E+08
Planck's constant h	6.62607015E-34
Proton mass m_p	1.67262192369E-27
<i>Derived:</i>	
$\beta = \mu\alpha/2\pi$	2.132525586
$q = \log_2\gamma*(1+\alpha^{-2}*\log_2\mu)$	404.628455366
$\Delta p = 2-1/(\alpha\mu+2)$	1.935060944
$p = cy/2 - \Delta p$	265.810766819
$p = 2q - cy + 3\log_2(2\pi)$	265.810766819
$q = 3cy/4 - 1 + 1/(\alpha\mu + 2) + 3*\log_2(2\pi)/2$	404.62845536601
$N = 2^q$	6.3870771836E+121
[kg m ² /s] $\hbar = h/2\pi$	1.05457182E-34
[kg] $m_f = m_p/(2\pi*2^{(2*\Delta p/3)})$	1.08862171145E-28
[s] $t_f = h/(c^2*m_f)$	1.07784860404E-23

We obtain: **Formulas**

In the formula for the anomalous magnetic moments of leptons, the coefficients clearly separate the first generation (1 in the numerator) from the second and third (both with numerators of 2). Although this difference is not reflected in the simple numerical ratio of masses in the Koide formula, it nevertheless points to a deeper ontological property: the first generation is essentially distinct – its Bošković *noncohesion* limit is smaller than its *cohesion* limit – while for the other two generations the opposite holds.

Hence my insistence on an improved Koide formula, even though the original one yields a result within measurement error margins. Furthermore, the improved Koide formula consistently gives the tau lepton mass as **3.167485*10⁻²⁷ kg** throughout CODATA history, confirming its predictive stability and ontological foundation, while the original yields **3.167735*10⁻²⁷ kg**. Which of these two values signifies what requires further analysis.

Table – Formulas

(1)	$q = 3cy/4 - 1 + 1/(\alpha\mu+2) + 3\log_2(2\pi)/2 = \log_2\gamma*(1 + \alpha^2*\log_2\mu)$ <p align="center"><i>connects neutron, proton and electron, the key constituents of the universe.</i></p>
(2)	$\alpha^{-1} = 2^{5/4}*[X^{1/2}*(tb/m_p^2)^{3/4} + X*(cs/m_p^2)^{3/2}]^{1/2}, X = (2\pi)^3*\beta^2*2^{-(2*\Delta p/3)}$ <p align="center"><i>obtained by combining four formulas for quarks.</i></p>
(3)	$2/(x*am - 1) + 2/(x*a\tau - 1) + 1/(x*ae - 1) = 1, x = 2\pi\alpha^{-1}$ <p align="center"><i>connects the anomalous moments of leptons.</i></p>
(4)	$1 - (2 - 2^{0.5})*\sin^2(x) = [(x^{-2} - 1)^{0.5} + 1]^{-1}$ <p align="center"><i>Applies to: $x = m_W/m_Z$, the mass ratio of the W and Z bosons.</i></p>
(5)	$\tau_\mu/t_f * \alpha^8 * \log_2(\pi) * [1-x/(2\pi)^3], x = \log_2\{\log_2[4/(3*3*13)+4\pi]\}$ <p align="center"><i>(for the muon); they are similar but longer, and all the others for lifetimes.</i></p>
(6)	$(m_e+m_\mu+m_\tau)/[(m_e/x)^{0.5}+m_\mu^{0.5}+m_\tau^{0.5}]2 - 1/(2\pi q/3) = 2/3, x = 2^{(2\Delta p/3)}/\beta$ <p align="center"><i>Improved Koide formula</i></p>
(7)	$x = N^{\{1/x - 1 / [16\pi*2^{(-16\pi/3x)}]\}}, \text{ for } x = 5.18165488012$ <p align="center"><i>That gives the Chandrasekhar limit ratio: $m_{ch}/m_p = x*2^p*N^{-1/x}$</i></p>

And for the electron magnetic moment in Excel notation, **to conclude** with the formula (8):

$$ae = 2^{(2+ (3*EXP(R3C)/4 - (R3C^2 * R8C^{-2}*R6C^{-1}*2^{((8-2/(R6C*R8C+2) - 2/(R6C*R8C+2^{12+2^{11}+2^{10}))/3))} + (2^{(2-1/(R8C*R6C+2))*R3C^{1.5})^2*R8C^{-2}*R6C^{-2} - (2-1/(R8C*R6C+2))/2) * (1+R6C^{-2}*LOG(R8C;2))^{-1} * (1+(2*R8C*(1+2*R3C*R6C^{-1})^{-1})^{0.5})^{-1} - (R8C*R6C^{-1} + (R8C*R6C^{-1} + (2^{(2-1/(R8C*R6C+2))*R3C^{1.5}})*R8C^{-1.5}*R6C^{0.5+2})^{-1}*R8C^{-1.5}*R6C^{0.5+2})^{-1}/2 - 2 = 0.00115965218130$$

where: $R3C = 2\pi$, $R6C = \alpha$, $R8C = \mu$, so we can verify this with *Copy/Past* in Excel fields.

Dedicated to the misunderstood Einstein of his later years, quoting him once more:

Imagination is more important than knowledge¹, Albert Einstein

References

- [1] Zivlak, B. (2013). *Calculate Universe 1*. <https://vixra.org/abs/1303.0209>
- [2] Zivlak, B. (2013). *Calculate Universe 2*. <https://vixra.org/abs/1304.0051>
- [3] Zivlak, B. (2013). *Calculate Universe 3 – Planck Units*. <https://vixra.org/abs/1305.0145>
- [4] Zivlak, B. (2016). *Cycle towards Methodology of Everything*. <https://www.gsjournal.net/Science-Journals/Research%20Papers/View/6283>
- [5] Bošković, R. J. (1763) *Philosophiae naturalis theoria redacta ad unicam legem virium in natura existentium*. Venice: Ex typographia Remondiniana. (2nd ed.)