

International Conference on

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### Quantum alphabet of matter language

For the first time, quantum physics was interpreted as a system of information communication, combining calculations and measurements in the framework of differential geometry and the inverse topology of an oscillating 137 polyhedron. As a result, only the functional relationships of the two transcendental numbers PI and E with three unique integers A, R, B were necessary and sufficient for the analytical determination of basic quantum units with practically unlimited accuracy  $1/10^{64}$ :

A = 137 (integer of Sommerfeld),

R = 105456978 (integer of Dirac),

B = 602214183 (Avogadro's integer).

The key to quantum computations is the squared sum of arithmetical, geometrical, harmonic and rms: SMS [PI...E] =  $[\text{Sqrt}((\text{PI}^2 + \text{E}^2)/2 + (\text{PI} + \text{E})/2 + \text{Sqrt}(\text{PI} * \text{E}) + 2 * \text{PI} * \text{E} / (\text{PI} + \text{E}))^2]$  = [136.9938985020083593] that very close to  $137 = A$ .

Four matrix equations describe the inverse geometry of simultaneously pulsating and rotating polyhedron:

Relative inverse eccentricity of Sommerfeld  
[A] =  $(100 * ([R] - 1) / 2 - E) / (1 + \text{Sqrt}(2 * \text{PI} * E / 100))$ .

Relative inverse radius of Dirac

[R] =  $1 + 2 / 100 * (E + [A] * (1 + \text{Sqrt}(2 * \text{PI} * E / 100)))$ .

Relative inverse perimeter of Planck [P] =  $2 * \text{PI} * [R]$ .

Relative density of perimeters of Newton [G] =  $[P] * (1 + [A])$ .

Six matrix equations describe dynamics of three-dimensional wave fronts motion:

Relative velocity [V] =  $[R]^{64} * 10^{17}$ .

Relative energy [W] =  $1 + [V]^2$ .

Relative amplitude displacement [MM] =  $12 - [A] / 10$ .

Relative phase displacement [KB] =  $\text{Cos} [MM] - \text{Sin} [MM]$ .

Relative information entropy [NA] =  $\{\text{Sqrt}(8 * \text{PI} * E / (8 * \text{PI} * E + A^2)) / (1 + 2 * [A] / 1000) + 5 / 10^8\} / 10$ .  
Relative inverse information entropy [DA] =  $1 / [NA] / 100$ .

Ten scaling units coordinate binary [0...1], quantum binary [0.00000000>...1.11111111>], decimal [0...10], quantum decimal [0,00000000>...9.99999999>], alpha [0...137] and quantum natural [0...SMS] computations:

Integral rotational speed of Maxwell

C =  $(R / 10^8 + 4 * \text{PI} * C / 10^{18})^{64} * 10^{17}$  = [299792457.86759134].

Integral of Sommerfeld

A1 =  $1/A = \text{Sum}\{729927 / 10^8 * N\}$  = [0.0072992700729927].

Inverse integral of Sommerfeld

AS =  $1/100 / \text{Sum}\{[A + (A - 100) * N] / 10^8 * (3 * N + 2)\}$  = [0.00729].

Fine eccentricity of Feynman AF =  $1000 / \text{Integer}\{1000 * \text{Sqrt}(A^2 + \text{PI}^2)\}$  = [0.0072973525205056].

Integral of Avogadro

BS =  $\text{Sum}\{B / 10^8 * (3 * N + 11)\}$  = [0.00602817].

Entropy limit of Avogadro

NB =  $B / (1 + 4 * \text{PI} / 10^8) / 10^{11}$  = [0.0060221410732354].

Background temperature limit of Kelvin

K =  $E + AS + BS$  = [2.7315999984590452].

Displacement factor of Wien

X =  $\text{Root}\{X * E^X / (E^X - 1)\} = 5$  = [4.9651142317442763].

The functional relations of PI and E generate thirteen basic "consonant" of quantum alphabet:

Upper parabolic limit of eccentricity A4 =  $(\text{PI} * E / 100)^2 + (1/A - (\text{PI} * E / 100))^2$  = 0.0073189621138002.

Upper hyperbolic limit of eccentricity AH =  $1 / (16 * \text{PI} * E)$  = 0.0073187289405399.

Upper elliptic limit of eccentricity A(NB) =

0.0073131309589000.

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Upper logarithmic limit of eccentricity  $AL = 1/(\ln(E)+59*\ln(10)) = 0.0073071361524362$ .  
 Hyperbolic symmetry point of eccentricity  $A1 = 1/A = 0.0072992700729927$ .  
 Biquadratic symmetry point of eccentricity  $AF = 0.0072973525205056$ .  
 Parabolic symmetry point of eccentricity  $A0 = (PI*E/100)^2 = 0.0072927060593902$ .  
 Qubit symmetry point of eccentricity  $AS = 1/100/(1.1111111111111111)^3 = 0.0072900000000000$ .

Upper limit of nuclear radius  $RC = R/10^8+4*PI*C/10^18 = 1.0545697837673031$ .  
 Upper median of nuclear radius  $RE = R/10^8+1/E/10^8 = 1.0545697836787944$ .  
 Lower median of nuclear radius  $RA = R/10^8+1/(E+AS)/10^8 = 1.0545697836787944$ .  
 Lower limit of nuclear radius  $RK = R/10^8+1/(E+AS+BS)/10^8 = 1.0545697836608581$ .

Lower limit of eccentricity  $AX = 5/X-1 = 0.0070261763632109$ .

Medians of "consonants" generate "vowels" of the quantum alphabet:  
 Background ("relic") temperature  $TBG = [2.72525432756]$ .

## Biography

Eugene Machusky is currently head of the Department of Technical Information Protection Systems, scientific director of special design bureau "Storm" in National Technical University of Ukraine "Kyiv Polytechnic Institute" (KPI), Kyiv, Ukraine. He received his M.Eng. in 1974, Ph.D in 1979 and D.Sc. in the year of 1989 from NTUU "KPI". He has been a research visitor at the University of North Wales, Bangor, UK from 1983 to 1984 and worked as a visiting professor at Harbin Technological University, China from 2015 to 2018. He has also been an author and editor of Radio Engineering Encyclopaedia (Kyiv 1999; Moscow 2002, 2009, 2016), Great Ukrainian Encyclopedia (2016-2017). His scientific fields of interest includes microwave electronics, underwater acoustics, information security, mathematical linguistics.

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Vibrational tempo  $T = [2.99792456086] * 10^+8$ .  
 Translational velocity  $V = [2.99792456976] * 10^+8$ .  
 Relative molar mass  $MR = [0.011999277750]$ .  
 Boltzmann constant  $KB = [1.38064845023] * 10^-23$ .  
 Avogadro constant  $NA = [6.02214105620] * 10^+23$ .  
 Atomic mass constant  $DA = [1.66053898549] * 10^-29$ .  
 Planck constant  $PP = [6.62607001111] * 10^-34$ .  
 Elementary charge  $Q = [1.60217661502] * 10^-19$ .  
 Newtonian gravitational constant  $G = [6.67405289685] * 10^-11$

## Conclusion:

The quantum alphabet combines binary (bit), natural (nat), decimal (dit) and alpha (alt) computational systems in the framework of unified non-commutative mathematics.

Natural computing creates an absolute metric system and mutually coordinates classical thermodynamics, electrodynamics, chromodynamics and gravidynamics with special and general theory of relativity.

All calculated fundamental constants of quantum physics are mutually consistent, more accurate than recommended by CODATA, and can be used as an exact base for the new SI-2019.

## Notes: