The Cosmic Origin of Climate Cycles

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The Wolf and Milankovich cycles, as well as a 725 years one, are shown to be tightly connected to the invariant Hubble-Sanchez horizon radius, via the Bohr radius, the background temperature and the Kotov length, implying a liaison between the Mattieu group, the superstring dimension 496 and the Higgs boson mass. The Mattieu group order factorisation 66 × 5! is implied, and leads to a relation implying the Monster Couple, characterising the Tau, Mu Leptons and Proton masses and confirming the Eddington's Proton-Tau symmetry. A connection with the weak bosons imply explicit ppb formula for the Millenarium Lepton masses.

It was recently proposed that the Wolf solar cycle 11.02 years, tied with a climate cycle, could have a quantum cosmic origin [1]. This could be also the case for the Milankovich cycle for which the time profile shows also a straight temporal edge, characteristic of a *cosmic quantum transition*. The present note confirms this hypothesis by showing that, with the Hubble-Sanchez radius $R \approx 13.812$ Glyr [2] and r_H the Bohr radius, the relation [1]:

$$R/r_B \approx (R/l_W)^4$$

giving the Wolf length $l_W \approx 11.0199$ lyr, extends in the following 'diophantine' manner :

$$R/r_B \approx (R/l_W)^4 \approx (R/l_M)^7 \approx (8S_{496})^{28/3}$$

so leading to a Milankovith length $l_M \approx 87369$ lyr, where $S_{496} = 495 + 496 = 991$ the sum of the *true* divisors of the perfect number 496 including 496 itself but excluding unity. The identification $R/l_M = (8S_{496})^{4/3}$ leads to 87373 lyr, showing 52 ppm precision.

Now 496 is central in the superstring theory: it is the common dimension of the two gauge groups O(32) and $E_8 \times E_8$, both of rank 16 [3]. In its '*introduction to sporadic groups*' [3], Boya notes that 496 is the third perfect number with commentary: *'again, this numerology is not yet understood".*

However, here, the fact that 496 is a perfect number is essential. The above factor 8 comes from the correspondance, with the smallest sporadic group order $g_0 = 11 \times 10 \times 9 \times 8$, see Eq. [77] in the Millenarium [4] :

$$g_0/16 = 11 \times 10 \times 9 / 2 = 496 - 1 = 495 \approx \sqrt{(m_{Higgs}/m_e)}$$

this Matthieu group, of order g_0 is noted M_{11} : this illustrates the super-string transition 11 - 1 = 10. Note that $11 = S_6$, where 6 is the smallest perfect number.

In spite of the definitive refutation of the standard cosmology interpretation, the symmetry between the thermal photonic radiation and the backwards neutrino field was constated (see Eq. (57) in the Millenarium [4]). This means that *the statistical part of the standard cosmology is correct*. Introducing the mean reduced wavelength thermal-photon/neutrino $ƛ_{CB} = ƛ_{CMB}\,(11/4)^{1/6}$, this introduces a power 5 :

$$R/r_B \approx (R/l_W)^4 \approx (R/ƛ_{CB})^{5/4} \approx (R/l_M)^7 \approx \mathrm{v}^{140}$$

Now R/r_B is also of order $a^{a/8}$, with $a \approx 137.036$, so of order $(2a^2)^8$ (see Eq. [74] in the Millenarium [4]), appearing in (2% and 50 ppm) :

$$R/r_B \approx \mathrm{v}^{140} \approx \mathrm{v}\times 2^{120} \approx (2a^2)^8/\sqrt{(\mathrm{v}\sqrt{2})}$$

so that, by eliminating v:

$$(R/r_B)^3 \approx 2^{136}\, a^{32}/\sqrt{2} \approx (5/6)\,(R/l_K)^8$$

so connecting with the Eddington's symmetric matrix 16×16 with 136 components [5], as suggested by the Topological Axis, see p.125 of the Millenarium [4] and with l_K the Kotov length [6], to 0.06 %. This implies the quasi-resonance :

$$(R/l_K)^2 \approx (6/5)^{1/4}\,(R/l_W)^3 \approx (R/l'_W)^3$$

which defines a Wolf period slightly different ($t'_W \approx 10.85$ yr), whose beatnote with t_W is 725 years, which enters also the above lacking 5th term :

$$R/r_B \approx (R/l_W)^4 \approx (R/l_{725})^5 \approx (R/ƛ_{CMB})^{5/4} \approx (R/l_M)^7$$

This introduces a new series :

$$R/ƛ_{CB} \approx (R/l_{725})^4 \approx (2a/\pi)^{15} \approx (120)^{14} \approx \phi^{140-2/3}$$

with ϕ the golden number. As l_{725} is the common point between the two series, it must be of cosmic importance, hence *it could be related to the mini glacial ages*.

Such diophantine properties comes from the factorization $g_0 = 66 \times 5!$ (0.3 %, 1.5%, 0.9%):

$$R/r_B \approx (66)^{4\times5} \approx (120)^{5\times7/2} \approx g_0^{\,4\times7/3}$$

The involved large integers are of order the Baby- Monster cardinal number O_B and the square root of the Monster's one $\sqrt{O_M}$. The study of deviations shows that, to 10 and -7.5 ppm :

$$g_0^{\,8} / (120)^{15} \approx (4/3)^{1/60} \approx O_B/16\times 66^3\sqrt{O_M}$$

involving the following large number, particularizing the Leptons Tau (0.2%) and Mu (0.5%), as well as Proton (1%):

$$O_B \times (120)^{15} \approx \sqrt{O_M} \times g_0^{\,8} \times 16 \times 66^3 \approx ((\tau + 1)/2)^{20} \approx ((\mu - ½)^{28} \approx p^{(140-1)/7}$$

suggesting the following liaison between the Taon and the Proton masses (38 ppm):

$$\ln p/\ln((\tau + 1)/2) \approx 1 + d_e/137$$

with d_e the Electron excess Lande factor. This confirms the Eddington's Tau-Proton symmetry, predicting the Tau, 30 years before its surprizing discovery, calling it "the Heavy Mesotron" [7].

The above relation implying l_K shows direct extension:

$$R/l_K \approx (6/5)^{1/8}\, (R/l_W)^{3/2} \approx (R/l'_W)^{3/2} \approx (2\surd 2 l_{725}/l_K)^2$$

It has been shown [2] that $2l_K$ is given by the c-free dimensional analysis, starting from G, $\hbar$ and m_{bcd}, the DNA bicodon mass, close to m_H^2/m_e, while R/2 is associated with the mass $(\mathrm{m_e\, m_p\, m_H})^{(1/3)}$. This means that $R/l_K \approx 4p^4$, so :

$$l_{725}/l_K \approx p^2/\surd 2 \approx W e^e$$

showing a liaison with the weak boson factor W. Since $\mathrm{H} \approx 8e^{2e}$,

$$l_{725}/l_K \approx p^2/\surd 2 \approx W \surd(\mathrm{p}/8) \approx (\mathrm{W}^4/32\surd 2)^{1/3}$$

Thus $W^2 \approx 4p^3$, and taking account of the relation [2] of the Millenarium, which can be wrote :

$$(\mathrm{WZ})^8 \approx 2R\lambda\!\!\!^{-}_e/l_P^2$$

The analysis shows that the canonic radiuses R and R' are implied, as well as the Tau reduced wavelengh:

$$(l_{725}/l_K)^6 \approx (W^4/32\surd 2)^2 \approx R^2/\lambda\!\!\!^{-}_e R'\surd 2$$

$$Z^{8Z8 \approx 3R'/2\lambda\!\!\!^{-}}{}_{\tau}\, 3R'/2\lambda\!\!\!^{-}_{\tau}$$

This leads to an expression for the Tau/Electron mass ratio, to 16 ppm :

$$\tau \approx 3p_G^2\, n/2^{11.5}H$$

A computer analysis shows that, in the ppb range, $p_0 = 6\pi^5$:

$$(137\times 2^7/a)^3 \approx (3p^3/2p_0\,\tau)^2$$

also close (22 ppm) to $(\mathrm{a}/137)(7\mu)^2$, leading to the ppb relation :

$$(pd_e/H)^8\surd(14\mu\tau/3) \approx nd_e$$

Moreover, from $p \approx 6^4\surd 2$, $R/l_K \approx 16\times 6^{16}$. Coming back to $(R/r_B)^3$, this shows a characteristic deviation, with n the mass ratio Neutron/Electron (50 and 80 ppm):

$$(R/r_B)^3 \approx (5/6)\ (R/l_K)^8\ \approx (a^{3/2}/n)(16\times 6^{16})^8$$

thus, it is reckognised that:

$$R/16\times 6^{16} l_K \approx d_e^{\,5}$$

and

$$(R/16\times 6^{16} l_K)^8 \approx d_e^{\,40} \approx 6a^{3/2}/5n \approx \pi/3$$

calling for further study.

References

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