Atiyah Constant excludes the Multiverse Hypothesis

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A simple fine tuning relation using the Atiyah Constant, the Eddington number 137 and the Fermi coupling constant defines the latter in its 5 × 10^{-7} indetermination, compatible with the 2 × 10^{-8} muon mass indetermination in another Cosmic Oscillation fine tuning relation. A symmetrical extension showing superstring 6D and 9D spaces gives a G value compatible with the Quinn measurement (2.5 × 10^{-5}), and the Coherent Cosmology value (10^{-7}). This confirms Atiyah's claims about Eddington rehabilitation and the exclusion of the Multiverse hypothesis.

In a recent Conference [1], Michael Atiyah claimed that the first order value of the electrical constant a is the series 1 + 8 + 128 = 137, rehabilitating the Eddington's value 137. Moreover, he argues that the constant defined by:

$$\Gamma = \gamma a/\pi \approx 25.17809725$$

would help the heavy QED calculations. *This leads presently to an intense polemics, a majority of theoreticians arguing that Atiyah, like Eddington, is becoming a crackpot with age*. The present Letter settles the debate. Indeed a simple computer study shows immediately that 137 and Γ enter the relation:

$$G_F/m_e c^2 \approx (\lambda\!\!\!^{-}_e/137\times 2\Gamma)^3$$

where $\lambda\!\!\!^{-}_e \equiv \hbar/m_e c$ is the reduced electron radius, and $G_F \equiv (\hbar c)^3/E_F{}^2 \approx 1.4358509(7) \times 10^{-62}$ Joule × m^3 is the Fermi coupling constant, corresponding to the Fermi energy $E_F \approx 292.806161(6)$ GeV ≈ 573007.33(25) $m_e c^2$ [2].

Since the Weinberg-Salam electroweak theory unifies electricity, characterized by a, and weak nuclear force characterized by G_F, a so precise relation (5×10^{-7}) shows that an Eddingtonian bridge exists between Atiyah approach and the electroweak theory. Admitting the above relation, this defines $F = E_F/m_e c^2 \approx 573007.3652$, inside its 2.5 10^{-7} indetermination. Now the latter enters another fine tuning relation, induced by the Kotov Coherent Cosmic Oscillation [3], implying the muon, proton and Hydrogen masses: $E_F/m_e c^2 \approx m_\mu{}^2\sqrt{(m_p m_H)}/a m_e{}^3$. This corresponds to a muon mass 206.7682869 m_e, inside its 2×10^{-8} measurement range.

Atiyah announced that analysis extension from quaternions to octonions could precise the G value. Now, the three first terms of the Combinatorial Hierarchy [4] are the Mersenne numbers 3, 7, 127, whose sum is 137, so giving in a different way the above first order of the electrical constant. The advantage of this procedure is that the following (final) term 2^{127}-1 gives the first order of the gravitational coupling, whose optimal form results from the gravitational Hydrogen molecule model [5] $a_G = \hbar c/G m_p m_H$. Computer analysis shows that the most symmetrical expression for the deviation is, with n the neutron/electron mass ratio:

$$(2^{127}/a_G)^{1/2} \approx (a/\pi)(nF/137^2\Gamma^3)^{-3}$$

exhibiting Atiyah's symmetry between a and π. Apart the natural 3D term, the powers 6 and 9 would means that 6D and 9D dimensions are implied, confirming superstring theory. This corresponds to:

$$G \approx 6.6754538 \times 10^{-11} \ \mathrm{kg^{-1}m^3s^{-2}}$$

very close (10^{-7}) to the optimal value deduced from Coherent Cosmology [5], and compatible with the BIPM measurements [6], in its 2.5×10^{-5} determination. This is at several sigmas from the tabulated Codata value, which results unwysely from a mean between discordant measurements.

These are striking examples of the extreme precision of the fine tuning between physical parameters, to be compared with the large imprecision of Anthropic Principle arguments. This confirms Atiyah's view in favor of a Single Final Theory, refuting the Multiverse hypothesis.

References

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