

# 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  $5 \times 10^7$  indetermination, compatible with the  $2 \times 10^8$  muon mass indetermination in another Cosmic Oscillation fine tuning relation. 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  $\Gamma$  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  $\times$  m<sup>3</sup> is the Fermi coupling constant, corresponding to the Fermi energy  $E_F \approx 292.806161(6)$  GeV  $\approx 573007.33(25) m_e c^2$  [2].

Since the Weinberg-Salam electroweak theory unifies electricity, characterized by  $a$ , and weak nuclear force characterized by  $G_F$ , a so precise relation ( $5 \times 10^{-7}$ ) shows that an Eddingtonian bridge exists between Atiyah approach and the electroweak theory. Admitting the above relation, this defines  $E_F / m_e c^2 \approx 573007.3652$ , inside its  $2.5 \times 10^{-7}$  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  $2 \times 10^{-8}$  measurement range.

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

[1] M. Atiyah <https://www.heidelberg-laureate-forum.org/>

[2] P.J. Mohr, D.B. Newell, and B.N. Taylor in arXiv:1507.07956 (2015)

[3] C. Bizouard, Les Oscillations Cosmiques. Conférence au Collège de France (2004)