The Critical Fermion Density of the Universe Found from Cyclic Universe E8 Symmetry Theory

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Abstract: Using cyclic universe E8 symmetry theory, a value for the critical fermion density of the universe is found in excellent agreement with published results. Also found is a very useful volume of 10^{27} cubic meters per active galaxy

Using 4(H-Z) x t "quanta of the universe[1]", where t is the present age of the universe together with an estimate of the number of active galaxies in the universe, one can calculate the critical density of the universe. I first use cyclic universe E8 symmetry theory[2] to find the equivalent transferred fermion mass of shielding –Z bosons. The "quanta of the universe" are utilized to obtain the number of negative mass bosons per active galaxy. The positive H boson components of the quanta are not used but are swallowed by supermassive black holes in our epoch. These holes had previously swallowed negative mass H bosons that had initially formed the supermassive black holes in the epoch before the big bang (thus acting to cancel the early supermassive black holes in our epoch). The t part of the quanta is the age of the universe in seconds (13.8 x10^9 x 31.557600 x 10^6) = 4.3549488 x 10^17 sec. This gives a total transferred fermion mass per active galaxy of Z x t = 91.19 x t = 3.971277 GeV = 5.7184955 x 10^7 Kg. The mass of a single hydrogen atom is 1.00811 x 1.686185 x 10^-27 Kg. The total number of mass equivalent hydrogen atoms is 5.7184955/ 1.6998599 = 3.3640981 x 10^53. Assuming 1 hydrogen atom per M^3 (a commonly accepted value of the critical fermion density), 3.36 etc. x 10^53 cubic meters is the volume of universe generated by a single active galaxy.

The inability to be able to estimate the number of active galaxies in the universe and thus the total mass of fermionic matter transferred during the age of the universe thus far, prompts other methods of estimating this mass from estimates of universe volume. This is done first by estimating the radius of the universe. This[3] is 4.29611 x 10^26 M. From this the volume is 4/3 pi R^3, or 4.1887065 x (4.29611)^3 x 10^78 = 4.1887065 x 79.291416 = 3.3212846 x 10^80 M^3. This volume is to be compared with the volume computed for a single active galaxy assuming cyclic universe E8 symmetry theory. This is 3.3640981 x 10^53 or only 1.28% larger numerically than the estimated total volume of the universe but 10^27 times smaller in volume. This remarkable nature-given result indicates that on the average each active galaxy occupies a cubic volume of space measuring 10^9 M on a side!

1. George R. Briggs, "The successful yet highly anthropic cyclic universe of E8 symmetry theory updated: the role of the 8 supersymmetric entities of life", viXra 1702.033077, (201

2. Ditto, Reference 1.

3. "Radius of the visible universe", Wikipedia, (2017)