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Dark Energy and the Age of the Universe JAMES DONOVAN, Shimer College — Most attempts to explain the nature and behavior of Dark Energy propose some scalar field to supply the energy, such as a cosmological constant, quintessence, phantom energy, tracker, and other scalar fields. The work described in this talk takes an entirely different tack, using a semi-classical approach to derive the dark energy from a previously unnoticed consequence of quantum mechanics on a cosmic scale. Because the age of the universe is finite, it follows that each quantum level in the universe is increased by a miniscule amount, $3*10^{-33}$ eV. The total effect of this small increment of energy is cumulative over all the quantum numbers in the universe. An estimation of the net sum of all the universe's quantum numbers (which overwhelmingly arise from gravity) is $\sim 4*10^{122}$, and the product of these values yields the total extra energy arising from this quantum mechanical effect. The result is close to the accepted value for the universe's Dark Energy content. With the additional assumption that time-dependent perturbative changes in the energy levels convert into matter, the value of the quantity of matter in the universe and the coincidence paradox are also resolved.

James Donovan
Shimer College

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