

## Pauli and the Accelerating Universe

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The observation that the expansion rate of the Universe has increased over the last 10 billion years is commonly attributed to “dark energy”, whose anti-gravitational properties are described by Einstein’s (“my biggest blunder”) cosmological constant. However, the nature of this dark energy, which alledgedly accounts for  $\sim 70\%$  of the total energy in the Universe, is unclear.

In this talk, I will show that there is actually a very simple and straightforward explanation for the observed expansion characteristics. This explanation does not involve new forces or unknown forms of energy, but is based on well-known physics: The fermion degeneracy pressure, which is generated to avoid violation of the Pauli Exclusion Principle.

Not only does this mechanism correctly describe the expansion characteristics of the Universe, it also explains its large-scale structure, as well as the spherical (*i.e.* non-flattened) nature of the dark matter halo that surrounds galaxies, including our own. Moreover, it makes it possible to calculate the present value of the Hubble constant from first principles and sets a lower limit on the neutrino mass. For the latter, we find  $m_\nu > 0.25 \text{ eV}/c^2$  (95% c.l.).