

# Planck Mass Rotons as Cold Dark Matter and Quintessence\*

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According to the Planck aether hypothesis, the vacuum of space is a superfluid made up of Planck mass particles, with the particles of the standard model explained as quasiparticle – excitations of this superfluid. Astrophysical data suggests that  $\approx 70\%$  of the vacuum energy, called quintessence, is a negative pressure medium, with  $\approx 26\%$  cold dark matter and the remaining  $\approx 4\%$  baryonic matter and radiation. This division in parts is about the same as for rotons in superfluid helium, in terms of the Debye energy with  $a \approx 70\%$  energy gap and  $\approx 25\%$  kinetic energy. Having the structure of small vortices, the rotons act like a caviton fluid with a negative pressure. Replacing the Debye energy with the Planck energy, it is conjectured that cold dark matter and quintessence are Planck mass rotons with an energy below the Planck energy.

*Key words:* Analog Models of General Relativity.