

SPACETIME SUPERFLUID SOUP TO GO

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In January 2018, I began developing a “theory of everything”, or more precisely, a unifying theory of nature that surpasses general relativity, quantum mechanics, and current era physics / cosmology. I aimed at parsimony and narrative, with an intuition that Maxwell’s equations might rule over all.

One concern was the force of gravity. I simply did not believe gravity was a force at a distance through a vacuum, even a roiling quantum vacuum, or more correctly, a roiling plasma of spacetime particles.

Other than the core and jets of supermassive black holes, every spoonful of the universe is permeated by a superfluid gas of spacetime particles. All matter is suspended in the temperature (energy), of the spacetime gas. You, me, earth, stars, ingested matter in black holes – each in different temperature soup.

As the spacetime soup cools and decays, its two fundamental particles ϵ^- and ϵ^+ , each 1/6 charge, react and cluster into standard model particles, with various behaviors partially described in the 2018 Particle Data Book, aka PDG*.

$$\begin{aligned} \text{electron} &= 6\epsilon^- \\ \nu \text{ electron neutrino} &= 3\epsilon^-/3\epsilon^+ \\ \text{up quark} &= 1\epsilon^-/5\epsilon^+ \\ \text{down quark} &= 4\epsilon^-/2\epsilon^+ \\ \text{proton} &= 6\epsilon^-/12\epsilon^+ \\ \text{neutron} &= 9\epsilon^-/9\epsilon^+ \end{aligned}$$

Standard matter exchanges energy with local spacetime gas, causing the gas temperature to increase and its density to decrease. Via convection, matter moves towards hotter spacetime gas according to the steepest temperature gradient. This is the force of gravity.

Maxwell’s equations rely upon the electric permittivity and magnetic permeability of free space, i.e., the quantum vacuum, i.e., the spacetime gas. Contrary to popular belief,

permittivity and permeability of spacetime are NOT constants. They vary based upon spacetime gas temperature.

The spacetime gas gets hotter (gains energy) as a function of the energy density of nearby matter. To enable the increased energy storage, the permittivity and permeability of the gas increases. This causes the effects that general relativity ascribed to curved spacetime, specifically refraction (lensing), a form of redshift, matter contraction, and time dilation.

The hottest matter-energy is the Planck core of a supermassive black hole. A Planck core is so hot that no more matter nor energy can be absorbed. Intermittently the Planck core breaches the event horizon and Planck plasma emits or jets, usually from the poles of the black hole. This matter to plasma recycling and jetting from galactic center SMBH offers new potential mechanisms to explain galaxy rotation curves.

Planck cores and plasma are at the Planck temperature, which is the hottest possible. The Planck plasma in the SMBH jets and along its journey in the universe, experiences a dynamic rate of cooling into spacetime gas and decay into standard matter-energy particles.

Photons flow and curve through the spacetime gas at local speed of light c , which is not a constant, but is in fact determined by local permittivity and permeability which are a function of spacetime gas temperature (energy).

Knowledge of the spacetime superfluid and recycling supermassive black holes opens the door to a new narrative for physics and cosmology that is parsimonious and simple.

*PDG reference:

M. Tanabashi et al. (Particle Data Group), Phys. Rev. D 98, 030001 (2018).

pdg.lbl.gov/2018/