434(5): Unification of General Relativity and Quantum Mechanics

Consider the infinitesimal line element in the most general spherically symmetric space. In plane polar coordinates:

$$ds^2 = m(r)c^2 dt^2 - \frac{dr^2}{m(r)} - r^2 d\phi^2 \quad -(1)$$

and in spherical polar coordinates:

$$ds^2 = m(r)c^2 dt^2 - \frac{dr^2}{m(r)} - r^2 d\theta^2 - r^2 \sin^2\theta \, d\phi^2 \quad -(2)$$

In a stationary metric, $m(r)$ is a function of r, for example in the obsolete Einsteinian general relativity:

$$m(r) = 1 - \frac{r_0}{r} \quad -(3)$$

where r_0 is the Schwarzschild radius:

$$r_0 = \frac{2MG}{c^2} \quad -(4)$$

However, EGR has been refuted in almost a hundred independent ways in the UFT series of papers.

More generally $m(r)$ is any function of r.

In plane polar coordinates, by definition:

$$d\underline{r} = \frac{\partial \underline{r}}{\partial r} dr + \frac{\partial \underline{r}}{\partial \phi} d\phi \quad -(5)$$

so:

$$d\underline{r} \cdot d\underline{r} = \left(\frac{\partial \underline{r}}{\partial r} dr + \frac{\partial \underline{r}}{\partial \phi} d\phi \right) \cdot \left(\frac{\partial \underline{r}}{\partial r} dr + \frac{\partial \underline{r}}{\partial \phi} d\phi \right) \quad -(6)$$

so

$$\frac{\partial \underline{r}}{\partial r} = \frac{1}{m^{1/2}(r)} \quad -(7)$$

and:

$$\frac{d\underline{r}}{d\phi} = \underline{r} \quad -(8)$$

Therefore:

$$\underline{r} = \frac{r}{m(r)^{1/2}}\,\underline{e}_r + r\phi\,\underline{e}_\phi. \quad -(9)$$

This is the radial vector $\underline{r}$ in m space, in plane polar coordinates. The frame (r, ϕ) in ~~flat~~ space is transformed to the frame (r_1, ϕ), where:

$$r_1 = \frac{r}{m(r)^{1/2}} \quad -(10)$$

Similarly from eq. (1):

$$dt_1^2 = m(r)\,dt^2 \quad -(11)$$

From eq. (11):

$$\frac{dt_1}{dt} = m(r)^{1/2} \quad -(12)$$

and from eq. (10):

$$\frac{dr_1}{dr} = \frac{1}{m(r)}\left(m(r)^{1/2} - \frac{d}{dr}\left(m(r)^{1/2}\right)\right)$$

$$= \frac{1}{m(r)}\left(m(r)^{1/2} - \frac{1}{2m(r)^{1/2}}\frac{dm(r)}{dr}\right) \quad -(13)$$

The Einstein / de Broglie equations of special relativity are:

$$E = \gamma mc^2 = \hbar\omega \quad -(14)$$

and

$$\underline{p} = \gamma m\underline{v} = \hbar\underline{\kappa} \quad -(15)$$

) and unify quantum mechanics and special relativity.
eneralizing these equations to m theory unifies general
relativity and quantum mechanics. The subscript 1 in
hat follows indicates that the quantities are written in
rame (r_1, ϕ). The total relativistic energy E_1 and
omentum $\underline{p}_1$ are:

$$E_1 = \gamma_1 m(r_1) mc^2 \quad -(16)$$

d

$$\underline{p}_1 = \gamma_1 m \underline{v}_1 \quad -(17)$$

here:

$$\gamma_1 = \left(m(r_1) - \frac{v_1^2}{m(r_1) c^2} \right)^{-1/2} \quad -(18)$$

and

$$\underline{v}_1 = \frac{\underline{v}}{m(r_1)^{1/2}} \quad -(19)$$

Eq. (17) gives:

$$E_1^2 = m(r_1) \left(p_1^2 c^2 + m^2 c^4 \right) \quad -(20)$$

The Schroedinger quantization in frame (r_1, ϕ)

s:

$$E_1 \phi = i\hbar \frac{\partial \phi}{\partial t_1} \quad -(21)$$

d

$$\underline{p}_1 \phi = -i\hbar \underline{\nabla}_1 \phi \quad -(22)$$

so the quantized energy and momentum levels in frame
(r_1, ϕ) are:

$$E_1 = \langle E_1 \rangle = i\hbar \int \psi^* \frac{\partial \psi}{\partial t_1} \, d\tau \quad -(23)$$

and

$$\underline{p}_1 = \langle \underline{p}_1 \rangle = -i\hbar \int \psi^* \underline{\nabla}_1 \psi \, d\tau \quad -(24)$$

From eqs. (16), (17), (23) and (24) the equations of the unification of general relativity and quantum mechanics are:

$$E_1 = \gamma_1 m(r_1) mc^2 = i\hbar \int \psi^* \frac{\partial \psi}{\partial t_1} \, d\tau \quad -(25)$$

and

$$\underline{p}_1 = \gamma_1 m \underline{v}_1 = -i\hbar \int \psi^* \underline{\nabla}_1 \psi \, d\tau \quad -(26)$$

These equations can be developed using:

$$\frac{\partial \psi}{\partial t_1} = \frac{\partial \psi}{\partial t} \frac{\partial t}{\partial t_1} = \frac{1}{m(r)^{1/2}} \frac{\partial \psi}{\partial t} \quad -(27)$$

and by assuming:

$$\underline{\nabla}_1 \psi = \frac{\partial \psi}{\partial r_1} = \frac{\partial \psi}{\partial r} \frac{\partial r}{\partial r_1} = \left(\frac{2m(r_1)^{3/2}}{2m(r_1) - \frac{dm(r_1)}{dr}} \right) \frac{\partial \psi}{\partial r} \quad -(28)$$

So:

$$\boxed{E_1 = i\hbar \int \psi^* \cdot \frac{1}{m(r)^{1/2}} \frac{\partial \psi}{\partial t} \, d\tau} \quad -(29)$$

In general relativity there are many more energy

5) Levels of E_1 Law in special relativity.

To consider this further, note that the Planck quantization is a limit and special case of Eq. (29) where:

$$n(r) = 1 \quad -(30)$$

and

$$\phi = e^{-i\omega t} \quad -(31)$$

It follows that:

$$E = \hbar\omega \quad -(32)$$

Q.E.D.

Using the usual assumption of quantum mechanics:

$$\phi(r,t) = e^{-i\omega t}\phi(r) \quad -(33)$$

then:

$$E_1 = \langle E_1 \rangle = \hbar\omega \int \phi^* \frac{1}{n(r)^{1/2}} \phi \, d\tau \quad -(34)$$

so the original Planck photon (32) is augmented by other photons, energy levels of Eq. (34). These photons are generated by n space itself, and seem to appear out of nothing. Schroedinger quantization in n space does not violate any law of conservation of energy / momentum.

Eq. (34) was suggested by co author Horst Eckardt.

Similarly, the momentum energy levels are given by:

$$p_1 = \langle p_1 \rangle = -i\hbar \int \phi^* \left(\frac{2m(r_1)^{3/2}}{2m(r_1) - \frac{dm(r_1)}{dr}} \right) \frac{d\phi}{dr} \, d\tau \quad -(35)$$

In the limit of special relativity:

$$m(r_1) = 1 \quad -(36)$$

and

$$\phi = e^{ikr} \quad -(37)$$

So

$$p_1 \rightarrow p = \hbar k. \quad -(38)$$

There are many more momentum levels in general relativity than in special relativity, so photons seem to appear out of nothing, without violation of conservation laws. By wave particle dualism, the same is true of any particle. Each particle has energy (29) and momentum (35). So all the observed particles can be described in this way, and the photon has a mass m as indicated experimentally by the $B^{(3)}$ field of 1991.