Schwarzschild radius: $r_S = \frac{2GM}{c^2} \therefore GM = \frac{c^2 r_S}{2}$

Definition: $\rho := \frac{r}{r_S}$

Newtonian gravitational potential: $V = \frac{-GM}{r} = \frac{-c^2 r_S}{2r} = \frac{-c^2}{2\rho}$

Required for escape to ∞: $E_{esc,m} = -E_p = -mV = \frac{mc^2}{2\rho}$ [1]

Einsteinian kinetic energy: $E_{k,rel} = (\gamma - 1)mc^2$

Newsteinian escape or free fall: $\frac{1}{2\rho} = \gamma - 1 \therefore \frac{1}{\gamma} = \sqrt{1-\beta^2} = \frac{2\rho}{1+2\rho}$

the escape limit is the *speed of light*: $\beta = 1 \therefore \frac{2\rho_{esc,min}}{1+2\rho_{esc,min}} = 0 \therefore \boldsymbol{\rho_{esc,min} = 0}$ 😳

Any mass can escape from any non-zero centre-to-centre distance to a gravitating mass. No matter how small this distance, a separate body *will* escape all the way to infinity, given it has sufficient energy according to [1] **or** $\gamma = 1 + 1/2\rho$ **.**

Bitte beachten Sie dies gut, Herr Schwarzschild!
Please take good notice hereof, Mr. Schwarzschild!

Now consider a photon: $E_\gamma = h\nu$

Rest mass of something that cannot be at rest is a *senseless* concept that has ***no*** value, not even zero!

Therefore, a photon has a relativistic mass only: $m^*_\gamma = \frac{E_\gamma}{c^2} = \frac{h\nu}{c^2}$

An essential difference between light and matter is that light *does* travel at the speed of light, which matter *cannot* ever achieve. Any mass requires ***in****finite* energy to achieve that velocity, whilst light only has *finite* energy at this very speed of light. Isaac Newton: *mass* = quantitas materiæ, amount of matter. Light just *isn't* matter.

Applying [1] renders: $E_{esc,\gamma} = \frac{m^*_\gamma c^2}{2\rho_{esc,\gamma}} = \frac{E_\gamma}{2\rho_{esc,\gamma}}$

for the escape limit, we find: $E_{esc,\gamma} = E_\gamma$

therefore: $2\rho_{esc,\gamma} = 1 \quad \therefore \boldsymbol{\rho_{esc,\gamma} = \frac{1}{2}}$

hence, light can escape to ∞ from: $\boldsymbol{r_{esc,\gamma} = r_S/2}$ ***HALF* the Schwarzschild radius!**

& at that distance, [1] renders **a mass's escape energy equal to:** $\boldsymbol{E_{esc,m} = mc^2}$ 🤔

This escape radius for light very clearly differs from the Schwarzschild solution by a factor of two. *And do you recognise some well-known equation?* Apparently, this famous fantastic fabulous formidable flawless physical formula also gives the energy that a mass requires in order to escape from light's true escape limit to infinity.

One should not compare *mass* and *light* by escape ***velocity***, but ***energy***. Using *velocity* is like comparing apples to oranges.

A mass escaping to ∞ will slow down, ultimately all the way to $E_k = 0 \therefore v = 0$; but isn't the speed of light a universal constant? *Newsteinian*[1] gravitational redshift by $\zeta = \gamma_{ff,NS} = (2\rho + 1)/2\rho = (2 \cdot ½ + 1)/(2 \cdot ½) = 2$ reduces a photon's *energy* received in the observer's frame to half of its value emitted in the source's frame when escaping from $r_S/2$ to ∞, whilst its *speed* of course remains unchanged. That's another difference between light and matter.

I can only conclude that the **Schwarzschild Solution** simply does **not describe reality**, although it is a mathematically correct solution of the **Einstein Field Equation**. This brings me to a not so pleasant judgement of the latter[2]... R.I.P.

[1] https://henk-reints.nl/HR-Newsteinian-mechanics.pdf
[2] https://henk-reints.nl/astro/HR-acceleration-gravitation-geodesic.pdf

Einstein also (correctly) found: $E = \gamma mc^2$ & $E_k = (\gamma - 1)mc^2$
yielding: $\gamma = E/mc^2$

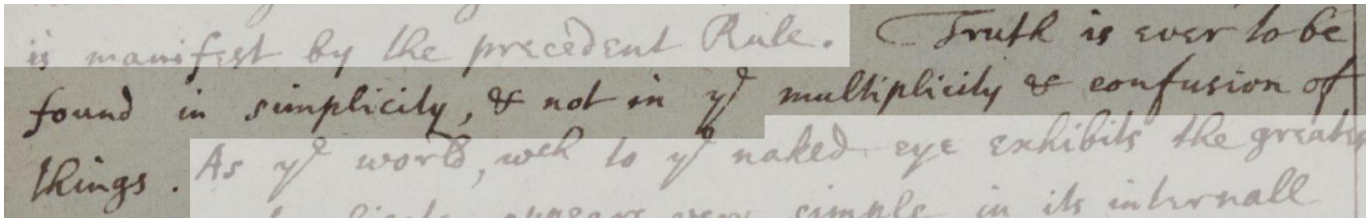
The Lorentz factor ~~equals~~ is the very same as the dimensionless specific total energy.

For a photon, we obtain: $E_{k,\gamma} = (\gamma_\gamma - 1)m_\gamma^* c^2 = (\gamma_\gamma - 1)E_\gamma$
like for radiation pressure, we have: $E_{k,\gamma} = E_\gamma \quad \therefore \gamma_\gamma - 1 = 1$
from which we easily conclude: $\boldsymbol{\gamma_\gamma = 2}$

The Lorentz factor of light equals *two*, which is frequency-independent.
This is in agreement with said finite energy of light at the very speed of light.

$\gamma = 1/\sqrt{1-\beta^2}$ only applies to masses; definitely *not* to light.

Sir Isaac Newton:


is manifest by the precedent Rule. Truth is ever to be
found in simplicity, & not in ye multiplicity & confusion of
things. As ye works, wch to ye naked eye exhibits the greate

Truth is ever to be found in simplicity, & not in the multiplicity & confusion of things.

Untitled Treatise on Revelation (section 1.1), Rule 9, fol. 14r
https://www.nli.org.il/en/manuscripts/NNL_ALEPH990026832700205171//NLI#$FL9002307

It is the fate of every truth to be an
object of ridicule when it is first acclaimed.
— Albert Schweitzer —
https://en.wikiquote.org/wiki/Albert_Schweitzer

It is a good morning exercise for a research scientist
to discard a pet hypothesis every day before breakfast.
— Konrad Lorenz —
https://www.brainyquote.com/topics/science-quotes

A scientific truth does not triumph by convincing its opponents and making them see the light, but rather because its opponents eventually die and a new generation grows up that is familiar with it.
— Max Planck —
https://www.brainyquote.com/topics/science-quotes

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Please consult: https://henk-reints.nl/u/ & https://henk-reints.nl/u/notensors.html .

