Newtonian mechanics:

Potential energy if two equal homogeneous spheres of mass M and radius R_0 are touching:

$$U_0 = \frac{-GM^2}{2R_0}$$

This uses the shell theorem, so it is as if two point masses M are at a distance of $2R_0$.

After merging into one single sphere of the same *density* as the original spheres, the new *radius* will be:

$$R_1 = R_0\sqrt[3]{2}$$

and then the total *gravitational binding energy* equals:

$$U_2 = \frac{-3}{5}\cdot\frac{G(2M)^2}{R_1} = \frac{-12}{5\sqrt[3]{2}}\cdot\frac{GM^2}{R_0}$$

The *gravitational binding energy* in the inner "old" sphere of radius R_0 equals:

$$U_3 = \frac{-3}{5}\cdot\frac{GM^2}{R_0}$$

Effectively, one of the spheres has transformed into a shell around this inner sphere. The *potential energy* of that shell equals:

$$U_1 = U_2 - U_3 = \left(\frac{3}{5} - \frac{12}{5\sqrt[3]{2}}\right)\cdot\frac{GM^2}{R_0}$$

The original *potential energy* U_0 minus this result should then be the amount of *energy* released, which will turn into a combination of *thermal energy* (*heat*) and radiated *energy*, for example via a gravitational wave. The total *energy* released is:

$$\Delta U = U_0 - U_1 = \left(\frac{12}{5\sqrt[3]{2}} - \frac{3}{5} - \frac{1}{2}\right)\cdot\frac{GM^2}{R_0} \equiv \xi\frac{GM^2}{R_0}$$

where:

$$\xi = \frac{24}{10\sqrt[3]{2}} - \frac{6\sqrt[3]{2}}{10\sqrt[3]{2}} - \frac{5\sqrt[3]{2}}{10\sqrt[3]{2}} = \frac{24 - 11\sqrt[3]{2}}{10\sqrt[3]{2}} \approx 0.805$$

In case of the merger of two identical *critical black holes* ($\frac{2GM}{c^2} = R_S = R_0$) the energy released equals:

$$\boldsymbol{E} = \xi\frac{GM^2}{2GM/c^2} = \frac{\boldsymbol{\xi}}{\mathbf{2}}\boldsymbol{Mc^2}$$

For *critical black holes* of the *neutron Compton density*[1] $\rho_{C,n} = 1.392\,128\,97 \times 10^{18}$ kg/m^3 we have $M = 7.235 \times 10^{30}$ kg, yielding:

$$\boldsymbol{E = 2.6 \times 10^{47}}\ \textbf{J} \approx 2150 \times L_{\odot} \times (10\ \text{bln. years}).$$

According to the virial theorem half of it becomes heat and the other half is radiated away or lost by other mechanisms. I did not do the calculations, but general relativity might yield a different result. *Quite night* said the Groninger[2]. Fact is however that gravitational waves are an observed phenomenon.

[1] http://henk-reints.nl/astro/HR-Incompressibility-and-black-holes.pdf

[2] Groningen is a Dutch province and in their dialect, the translation of *I don't know* is pronounced *quite night* (with the emphasis on *quite*).

We observe the universe as a more or less homogenous sphere around us with a *radius* equal to the *Hubble distance*. You can look just that far in *any* direction, so *YOU* are the very centre of the cosmos...

Applying the formula for *gravitational binding energy*: $U = \frac{3}{5} \cdot \frac{GM^2}{R}$ to the entire universe with[3] $M = 8.77 \times 10^{52}$ kg $\asymp 7.88 \times 10^{69}$ J and substituting the *Hubble distance* for R, we obtain:

$$U_{g,U} = 1.18 \times 10^{69} \text{ J.}$$

This is roughly 10^{22} times the just calculated black hole merger *energy*. 10^{22} also approximates the total number of stars in the universe, but as yet I think that might well be a coincidence.

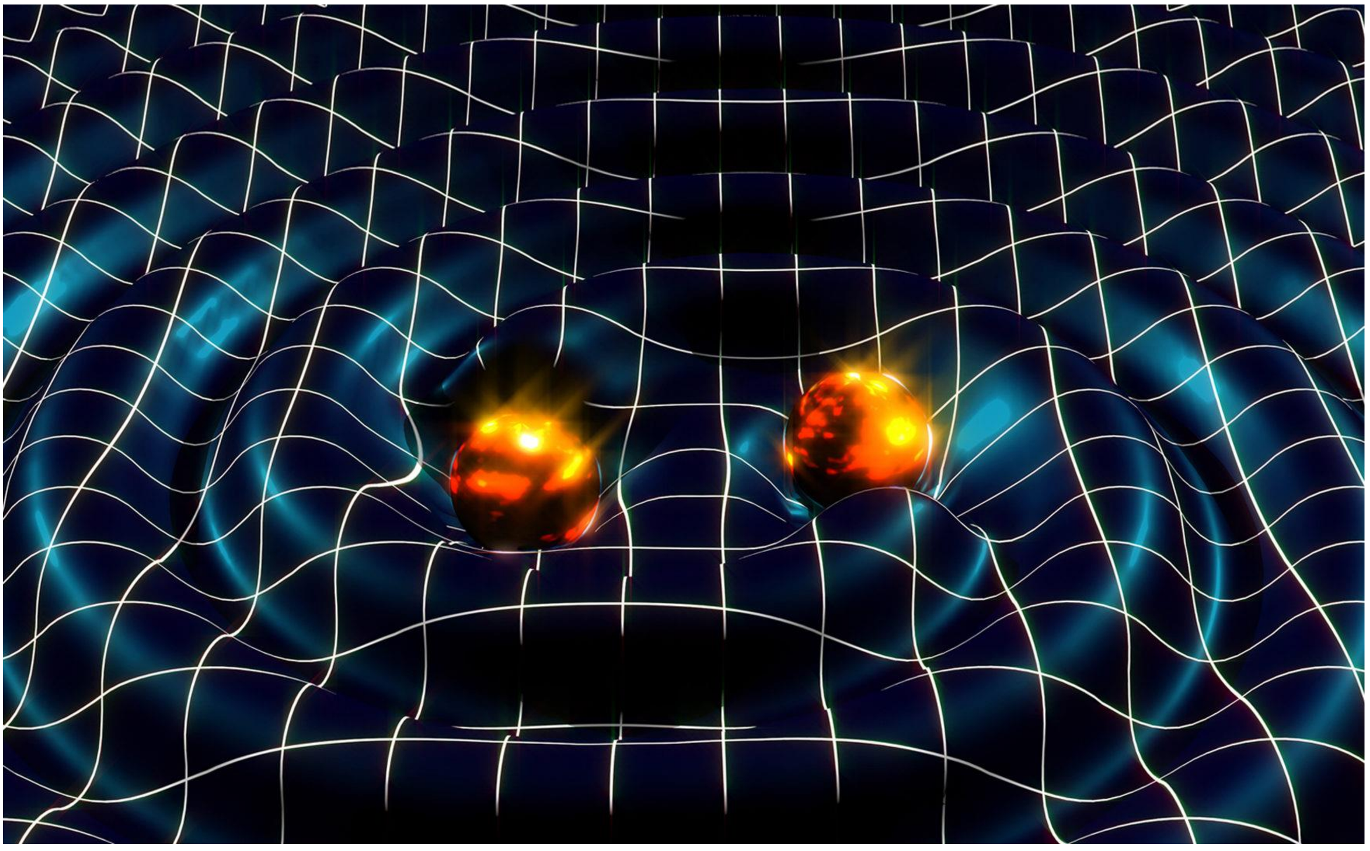
And the universe is a glome (a 3-sphere) so the above application of $U = \frac{3}{5} \cdot \frac{GM^2}{R}$ cannot be correct and I do not intend to calculate the 3-spherical equivalent, but I think it will yield a far lower value. Moreover[3], if $GH = constant$ so $G \propto t$, then $U_{g,U}$ also becomes far less.

The total disintegration energy of the *IniAll*[4] equals:

$$E_{IniAll} = 6.62 \times 10^{66} \text{ J.}$$

Half thereof would have been taken away by the neutrinos.

𝄞ravitational waves ♫



https://cdn.worldsciencefestival.com/wp-content/uploads/2016/04/Gravitational-Waves-e1509124765609.jpg

[3] http://henk-reints.nl/astro/HR-mass-univ-grav-const.pdf
[4] http://henk-reints.nl/astro/HR-CMB.pdf