Are black holes deflected by a gravitational potential?

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Abstrakt:
Gravitation is not a force. The equilibrium of forces therefore does not apply to gravity. A black hole in the middle of a galaxy influences the trajectories of the stars with its gravitational potential. Is the black hole's trajectory also influenced by the stars or by distant galaxies?

Keywords:

Dark Energy, M.O.N.D., GW150914, Black Hole, ART

Consideration:
The general theory of relativity explains gravity through the curvature of space in four-dimensional space-time. The time and the distances are not constant, they are changed by gravity. If the gravitational potential is higher, the time passes slower and the distances become greater.
Example: The moon orbits the earth. One side of the moon faces to the earth. Both sides move freely and without acceleration through space-time. On the earth side of the moon, the gravitational potential is higher because it is closer to the center of the earth. Here the time runs slower and the distances are greater than on the far side. Due to the different gravitational potential on both sides, the moon moves on a circular path around the earth. It is deflected in the direction of the higher gravitational potential.
This example does not apply to a black hole. The space-time curvature has a maximum limit. For a black hole that is not rotating, the maximum limit is the event horizon in the form of a spherical surface - the Schwarzschild radius r_s. From our point of view, the gravitational potential there is so high that the distances there become infinitely great and time stands still. If a black hole is accelerated from our point of view (GW150914), it would have to cover an infinitely long distance in an infinitely short time. This contradicts the theory of relativity. The maximum possible speed is the speed of light c. It is therefore not possible to observe the rotation of one black hole around another black hole.
A black hole is surrounded by an event horizon with its maximum gravitational potential. The black hole can not be deflected in the direction of the higher gravitational potential because there is no higher potential.

Attachment:
Time change of the observer dt as a function of the time change at the Schwarzschild radius $d\tau$[1]:

[1] https://de.wikipedia.org/wiki/Zeitdilatation#Zeitdilatation_durch_Gravitation

$$dt = \sqrt{\frac{1}{1 - \frac{r_s}{r}}} * d\tau$$

With $r = r_s$

$$dt = \infty \text{ or } d\tau = 0$$

The line element at the event horizon becomes infinite:[2]

$$ds^2 = -c^2 \left(1 - \frac{r_s}{r}\right) dt^2 + \frac{1}{1 - \frac{r_s}{r}} dr^2 + r^2 d\theta^2 + r^2 \sin^2 \theta \, d\Phi^2$$

With $r = r_s$

$$ds^2 = \infty$$

[2] https://de.wikipedia.org/wiki/Schwarzschild-Metrik#%C3%84u%C3%9Fere_L%C3%B6sung