

## 54.2: Gravitational Potential

---

Sometimes it is useful to define a gravitational potential, which is a property of space, rather than a property of the bodies present the way force and potential energy are. To find the gravitational potential, suppose we have a mass  $m$  creating a gravitational field in space. We put a small "test mass"  $m_0$  in space near mass  $m$ , determine the gravitational potential energy on the test mass due to  $m$ 's mass, and divide the resulting potential energy by  $m_0$ . The result is the gravitational potential  $\mathcal{E}$ . For a point mass  $m$ ,

$$\mathcal{E} = -\frac{Gm}{r}. \quad (54.2.1)$$

---

54.2: Gravitational Potential is shared under a [CC BY-NC-SA 4.0](https://creativecommons.org/licenses/by-nc-sa/4.0/) license and was authored, remixed, and/or curated by LibreTexts.