

Astronomy III
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General Relativity

General Relativity incorporates gravity - it's a theory of gravity as a geometric response to matter by space-time.

The "equivalence principle" says that the effects of acceleration and gravity are indistinguishable - therefore any gravity can be replaced by a suitable acceleration.

Just as the acceptance of c as always constant had profound ramifications, so does this.

Three foundational predictions of GR, all borne out by observation:

1) light is bent in a gravitational field
(solar eclipse of 1919)

2) gravitational redshift (time slows in a gravitational field)

3) orbital precession - the perihelion of Mercury's orbit advances by twice the Newtonian prediction, extra $43''$ /century