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Understanding gravity, the general theory of relativity, Einstein's radically new vision of the interplay of space, time, matter and energy, became the nexus for a wide range of foundational issues and the unification of nature's forces. General relativity is now a powerful research tool.

Isaac Newton: every object, whether on Earth or in the heavens, pulls on every other with a force that depends solely on how big the objects are, implies that gravity exerts its influence from one location to another instantaneously. That's not only faster than light, its infinite.

Einstein refined, gravitational influences do not out run light- the mechanism is manifest: When the Sun pulls on the Earth, that pull is exerted across space-empty space. There is not direct contact. So what invisible hand is at work exerting gravity's bidding?

Matter such as the Sun and the Earth, causes space around it to curve, and the resulting warped shape of space influences the motion of other bodies that pass by....that the curved contours of space would nudge a batted baseball to follow its familiar parabolic path and coax the Earth to adhere to its usual elliptical orbit "circulation"...a tangible entity that could effect change, Einstein realized that time could warp, too.

Einstein proposed that the nearer clocks are to massive body the slower they will tick, reflecting the influence of gravity on the passage of time. Einstein's math suggests that objects are drawn toward locations where time elapses more slowly, recasting of gravity in terms of space and time~ a predictive mathematical framework that would precisely describe the choreography danced by space, time and matter...provided the geometrical language for describing curved shapes, of gravity in terms of the geometry of space and time...that beams of light emitted by distant stars would travel along curved trajectories as they passed through warped region~ gravity probe~ MIT and Caltech detected gravitational waves~ LIGO...detection of ripples in space confirmed links between the theory and observation can yield powerful new applications...gravity bends lights trajectory causing a pattern of brightening and dimming= global positioning system GPS.

The next phase of astronomy may well center on gathering gravitational waves~ because waves ripple through space as waves ripple through air, scientists speak of “listening” ...to celebrate having finally heard the sounds of creation. ~ **Brian Greene**