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Generalizing Newton's Laws to achieve a better understanding of gravitation JOHN LAUBENSTEIN, Charitable Management Systems, Inc. — According to General Relativity (GR), what we spatially observe as nature is the projection of events occurring on a curved four-dimensional space-time manifold projected back onto the three-dimensional world in which our senses perceive. As such, an object that appears in three dimensions to accelerate due to the influence of gravity is in actuality experiencing no external force and is following a straight line as defined by a curved four-dimensional geometry. This insight was a brilliant way to preserve Newton's First Law. Yet, even in three-dimensions we are aware that the observer in free fall feels no acceleration and therefore cannot truly be classified as being under the influence of a force. This is generally described as transforming away the force through free fall, but the reality remains that an observer in free fall never feels acceleration. This suggests that it is equally valid - and perhaps preferential - to generalize Newton's Laws to accommodate our three dimensional spatial observations. Using this approach, it is valid to generalize Newton's Laws from the special case of a balanced distribution of mass-energy in the universe to the general case where the mass-energy distribution of the universe is unbalanced. In the general case, the motion of a test particle may increase in velocity without the presence of an external force in agreement with observation. Generalizing Newton's Laws can be shown to sharpen our understanding of gravity and sheds a significant new perspective on the century long influence of the Equivalence Principle.

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