

I have identified the new physics by 'decoding' what the actual physical energy source in gravity is. The unique ability of these dual-energy physics discovered in gravity to also explain the origin and expansion of our universe provides a profoundly significant confirmation for their reality. The initial proof for negative energy in gravity follows directly from properly applying known fundamental properties of energy as a test for energy in gravity. The proof follows from a clear understanding of what the principle of mass energy equivalence and gravitational effects from the presence of any form of physical energy actually implies for gravitational energies. Potential mass merger escalation demonstrates that 'gravitational potential energy' is not a quantifiable physical entity and no gravitational effect can be associated with it. The dual-energy principle could have been identified much earlier, definitively after the realization of cosmic expansion almost a century ago. Einstein came somewhat near to realizing dual-energy when briefly considering a role of negative mass in the context of his cosmological constant.

The new dual-energy physics had to be identified from physical considerations outside the current methodological approach in cosmology. The current approach involves the application of a mathematical model of the universe described by the Friedmann equations. That model is – as the new theory is able to now demonstrate – quantitatively and fundamentally flawed and can only demonstrate its own falsification as inconsistencies solidify. Its underlying assumption - that the observed redshift of galaxies indicates expansion is an effect of accelerated masses - has been misleading cosmology over many decades. While the fundamental cause for expansion had remained a mystery, the main goal in research had been to at least quantitatively replicate the observation of our expanding universe. Yet, the behavior of the universe kept on fundamentally disagreeing with this model, as has become most obvious in the apparent acceleration of expansion. Top-down deliberate fixes have been introduced in response, most notably 'dark energy'. The admittedly very fascinating mathematical model of a kinetic expansion had favored speculative approaches. As standard for good evidence in cosmology was seen where a speculative approach provided consistencies under the model. However, any assumed consistencies on cosmic parameters such as the age of the universe and its dark energy content, have been relying on the application of the same false model.

In stark contrast the new dual-energy cosmology comes from direct evidence for its physical mechanism as the energy source in gravity. It directly and naturally explains the origin and expansion of our universe by demonstrating an unprecedented bottom-up physical model. It naturally avoids or removes physical contradictions in the current model such as an initial singularity that should not have expanded. Dual-energy theory provides a clear-cut alternative to current single-energy theory. As the fundamental dual nature of energy may be either right or wrong, it constitutes a fundamental binary question. The characteristic elements of disproof of single-energy theory therefore serve as proof for the dual-energy universe. Check the [side-by-side comparison](#). Dual-energy theory reflects a deeper level of physical understanding as it brings fundamental questions such as the origin of energy and the flatness of space within the reach of known and knowable physics. It demonstrates a fundamental simplicity and symmetry of the universe. This suggests strong immediate evidence for fundamental dual-energy physics.

As a nod to the current expectation for quantitative confirmation I have identified a testable quantitative prediction from fundamental considerations under dual-energy theory: The age of the universe should be significantly older than the currently assumed 13.77-13.85 billion years. This relates

to an expected phase of much slower expansion in the early era of formation of first galaxies, black holes and stars than current theory assumes. A signature for this may be detected from the following factors and/or a combination of these: luminosity distance to redshift relationship of high redshift objects, astrophysical age determination of objects observed at any redshift, modeling of time requirement for evolution from smooth energy distribution in CMB to first observable galaxies.