Einstein’s Field Equations: 3 Criticisms

ABSTRACT
Does string theory with the finite nature hypothesis imply MOND and no supersymmetry?
Consider 3 conjectures: (1) Milgrom is the Kepler of contemporary cosmology, and the empirical validity of Milgrom’s MOdified Newtonian Dynamics (MOND) requires a modification of Einstein’s field equations. (2) The Koide formula suggests that there might be a modification of Einstein’s field equations. (3) Lestone’s heuristic string theory suggests that there might be a modification of Einstein’s field equations. Are (2) and (3) sure bets? No. Is (1) a sure bet? I say yes. I suggest that there might be 3 possible modifications of Einstein’s field equations. Consider Einstein’s field equations: R(mu,nu) + (-1/2) * g(mu,nu) * R = - κ * T(mu,nu) - Λ * g(mu,nu) — what might be wrong? Consider the possible correction R(mu,nu) + (-1/2 + dark-matter-compensation-constant) * g(mu,nu) * R * (1 - (R(min) / R)^2)^(1/2) = - κ * (T(mu,nu) / equivalence-principle-failure-factor) - Λ * g(mu,nu), where equivalence-principle-failure-factor = (1 - (T(mu,nu)/T(max))^2)^(1/2) — if dark-matter-compensation-constant = 0, R(min) = 0, and T(max) = +∞ then Einstein’s field equations are recovered. This brief communication offers 3 criticisms involving physical assumptions used by Einstein when he formulated his field equations.

MILGROM, KOIDE, AND LESTONE
What might be 3 important questions concerning the foundations of physics? Is Milgrom the Kepler of contemporary cosmology? Is the Koide formula essential for understanding the foundations of physics? Is Lestone’s heuristic string essential for understanding the foundations of physics?

https://arxiv.org/abs/1301.3907 by Pavel Kroupa, Marcel Pawlowski, and Mordehai Milgrom. "The failures of the standard model of cosmology require a new paradigm." *International Journal of Modern Physics* D 21.14 (2012): 1230003.
http://www.weizmann.ac.il/particle/milgrom/ Mordehai (Moti) Milgrom, Weizmann Institute of Science
http://en.wikipedia.org/wiki/Koide_formula
https://arxiv.org/abs/physics/0703151 “Physics based calculation of the fine structure constant” by John P. Lestone, 2009
http://permalink.lanl.gov/object/tr?what=info:lanl-repo/lareport/LA-UR-16-27659 Los Alamos Report LA-UR-16-27659 “Semi-classical Electrodynamics: A Short Note” by John Paul Lestone, issued 2016-10-05

EINSTEIN’S “THE MEANING OF RELATIVITY”, 5TH EDITION, PAGES 83 AND 84
[edit note: for page 83, all except last paragraph of page 83 deleted]
If there is a analogue of Poisson’s equation in the general theory of relativity, then this equation must be a tensor equation for the tensor g(mu,nu) of the

gravitational potential; the energy tensor of matter must appear on the right-hand side of this equation. On the left-hand side of the equation there must be a differential tensor in the g(mu,nu). It is completely determined by the following three conditions:

1. It may contain no differential coefficients of the g(mu,nu) higher than the second.
2. It must be linear in these second differential coefficients.
3. Its divergence must vanish identically.

The first two of these conditions are naturally taken from Poisson's equation. Since it may be proved mathematically that all such differential tensors can be formed algebraically (i.e. without differentiation) from Riemann's tensor, our tensor must have the form

R(mu,nu) + *a* g(mu,nu) R

in which R(mu,nu) and R are defined by (88) and (89) [edit note: see page 77]. Further, it may be proved that the third condition requires *a* to have the value – 1/2 . For the law of the gravitational field we therefore get the equation

(96) R(mu,nu) – (1/2) g(mu,nu) R = – κ * T(mu,nu) .

Equation (95) [edit note: see deleted part of page 83] is a consequence of this equation. κ denotes a constant, which is connected with the Newtonian gravitational constant.

CRITICISMS OF EINSTEIN'S ASSUMPTIONS

Condition 2 assumes that scaling is perfect with respect to R. If R ≥ R(min) uniformly for some positive constant R(min), then Condition 2 is not satisfied. The Koide formula suggests that squareroot(mass-energy) might somehow be construed as area. If so, the entire universe might undergo an instantaneous (i.e. one Planck time interval) collapse. If the universe collapses when the average temperature of the universe gets too cold, then Einstein was wrong.

Condition 3 assumes that gravitational energy is conserved in the Newtonian approximation. Milgrom's MOND suggests that gravitational energy might not be conserved.

The assumption that the energy-density is faithfully represented by a tensor might not true. If scaling is not perfect with respect to the energy tensor T(mu,nu) then the assumption might break down if the energy-density is sufficiently large. Lestone's heuristic string theory suggests that energy-density is not faithfully represented by a tensor at the Planck scale — even after quantum averaging.

IS DAVID BROWN MERELY A CRACKPOT?

Somewhere over the rainbow bending
Gravity is trending
TO PROVE MILGROM CORRECT
THE TRUTH YOU CANNOT DEFLECT.

If David Brown is a crackpot, then Milgrom is the Kepler of contemporary cosmology — on the empirical evidence.

Is this fiction with little entertainment value? Our universe was born 13.82 billion years ago. It would have expanded forever in the dark energy and inflationary mode of Newton and Einstein, but for the fact, noticed by Milgrom, that Newton and Einstein were not quite right. Gravitons, unlike photons, gluons, and all other fundamental particles, can sometimes escape from the boundary of the multiverse into the interior of the multiverse. This process of escape, appearing as dark energy, causes a slight excess of gravitational red shift known as dark matter and a slight excess of flattening in spacetime known as Milgromian inflation. Thus our universe expands, collapses in one Planck time interval and is reborn every 81.6 ± 1.7 billion years.