

Where Are the Dark Matter Particles?

Consider the Milgrom Denial Hypothesis: The main problem with string theory is that string theorists fail to realize that Milgrom is the Kepler of contemporary cosmology. Is it possible that Milgrom's acceleration law is wrong? No, because Milgrom, McGaugh, Kroupa, and Pawlowski have elaborated too much empirical evidence in its favor. There are only 2 possibilities: (1) Newtonian-Einsteinian gravitational theory is 100% correct but appears to be significantly wrong for some unknown reason. (2) Newtonian-Einsteinian gravitational theory really is slightly wrong. Where did Newton go wrong? Lex III: *Actioni contrariam semper et æqualem esse reactionem: sive corporum duorum actiones in se mutuo semper esse æquales et in partes contrarias dirigi*. To every action there exists a contrary and equal reaction: in other words, the actions of two bodies in relation to each other are always equal and directed in contrary parts. Within the universe to every action there exists a contrary and equal reaction. Newton's Third Law should perhaps be: Within the multiverse to every action there exists a contrary and equal reaction provided that the action and the reaction are both confined to one particular universe. In other words, I suggest that Newton and Einstein made the mistake of assuming that gravitational energy is conserved. Start with Kepler's laws and follow Newton's reasoning with the removal of the assumption that gravitational energy is conserved. The result is not $F = G * m_1 * m_2 / r^2$ but instead $F = ((1 - 2 * D-M-C-C)^{-1}) * G * m_1 * m_2 / r^2$, where D-M-C-C = dark-matter-compensation-constant = 0 if gravitational energy is conserved, > 0 if gravitational energy is unexpectedly large, and < 0 if gravitational energy is unexpectedly small. In the standard form of Einstein's field equations replace the $-1/2$ by $-1/2 + \text{dark-matter-compensation-constant}$ to get the alleged Fernández-Rañada-Milgrom effect, where the constant is approximated $\sqrt{(60 \pm 10)/4} * 10^{-5}$.

MILGROM versus CONVENTIONAL WISDOM ON DARK MATTER

Thirty years after Milgrom's initial publication, MOND has failed to persuade the majority of cosmologists.

http://en.wikipedia.org/Modified_Newtonian_dynamics

"I think few people appreciate that the main difficulty for DM is that the host of regularities pointed out by MOND, if taken as just a summary of how DM behaves and interacts with normal matter, suggests that these two matter components are coupled and correlated very strongly in many ways." — M. Milgrom

<http://www.americanscientist.org/issues/pub/dark-matter-heretic> "Dark-Matter Heretic", interview of Mordehai Milgrom by Michael Szpir, Jan-Feb 2003, American Scientist

"... we are missing something fundamental about the nature of our universe." — Stacy McGaugh

http://en.wikiquote.org/wiki/Stacy_McGaugh

“... it became apparent that the LCDM CCM accounts poorly for the properties of the satellite galaxies and their distribution about the Milky Way. Warm dark matter models fared no better.” — Pavel Kroupa

http://en.wikiquote.org/wiki/Pavel_Kroupa

“It seems to me that in understanding MOND and its fundamentals we have only scratched the surface.” — Mordehai Milgrom

http://en.wikiquote.org/wiki/Mordehai_Milgrom

MILGROM versus CONVENTIONAL WISDOM ON STRING THEORY

“String theory is extremely attractive because gravity is forced upon us.” — Edward Witten

http://en.wikiquote.org/wiki/Edward_Witten

“New doors opened for string theory when in 1974 it was proposed to identify the massless spin-two particle in the string’s spectrum with the quantum of gravitation. String theory became then the most promising candidate for a quantum theory of gravity unified with the other forces and has developed into one of the most fascinating theories of high-energy particles.” — K. Becker, M. Becker & J. H. Schwarz

http://books.google.com/books/about/String_Theory_and_M_Theory.html?id=WgUkSTJWQacC “String Theory and M-Theory: A Modern Introduction” by K. Becker, M. Becker & J. H. Schwarz

Note that in the book “String Theory and M-Theory” there is no mention of Milgrom. String theorists have not refuted Milgrom’s ideas but obstinately ignored them. I conjecture that there are two basic variants of string theory: (1) Newtonian-Einsteinian string theory and (2) Milgromian string theory. Newtonian-Einsteinian string theory implies Newtonian-Einsteinian gravitational theory and the existence of dark matter particles in the form of superpartners. Milgromian string theory implies Milgromian gravitational theory and the nonexistence of dark matter particles.

“The dual dwarf galaxy theorem is violated by the real universe and thus the standard model of cosmology is ruled out: Dynamically relevant dark matter cannot exist in galaxies. (The search for it will be fruitless.)” — Pavel Kroupa

<https://www.youtube.com/watch?v=UPVGDxNSBZM> Pavel Kroupa - The vast polar structure around the Milky Way and Andromeda – YouTube (quote from 52:04 of 1:12:26)

I suggest that Milgrom’s opponents have underestimated him. The opponents of MOND need to point out where Milgrom, McGaugh, Kroupa, and Pawlowski have made mistakes — ignoring evidence is not a refutation of the alleged evidence.

I suggest that proponents of MOND have failed to understand the merits OF SIMPLICITY of Newton’s derivation of his law of gravitation. The SIMPLEST WAY TO CHALLENGE NEWTON is to say the result is not $F = G * m_1 * m_2 / r^2$ but instead $F = ((1 - 2 * D-M-C-$

$C)^{-1}) * G * m_1 * m_2 / r^2$, where D-M-C-C = dark-matter-compensation-constant = 0 if gravitational energy is conserved, > 0 if gravitational energy is unexpectedly large, and < 0 if gravitational energy is unexpectedly small. Any modification of Newton-Einstein gravitational theory must lead APPROXIMATELY to the preceding trichotomy provided that Kepler's laws are approximately valid and Newton's reasoning is valid. To those who challenge Newton and Einstein I say this: State precisely where Newton and Einstein went wrong. Am I wrong about the alleged Fernández-Rañada-Milgrom effect? What precisely might be wrong with Newton's reasoning concerning his law of universal gravitation?

https://en.wikipedia.org/wiki/Newton's_law_of_universal_gravitation

If you replace the dark-matter-compensation-constant by a dark-matter-discrepancy-function then YOU STILL NEED to account for Kepler's laws because Kepler's laws are approximately valid. A constant function is generally simpler than a non-constant function. THE SIMPLEST DEVIATION SHOULD BE CONSIDERED BEFORE MORE COMPLICATED DEVIATIONS. What would explain the unexpected deviation predicted by the dark-matter-discrepancy function? Try to explain the deviation in simple physical terms. Those who challenge Newton and Einstein need to keep the preceding considerations in mind. Is non-conservation of gravitational energy an empirical proof that alternate universes exist?

SUPERSYMMETRY versus FINITE NATURE

"... there is one non-trivial way to extend the spacetime symmetries, and that is to incorporate supersymmetry. ... in any string theory, nature always looks supersymmetric at sufficiently high energy scales. If string theory is telling us something about nature, nature is supersymmetric at some energy scale ..." — Joseph Conlon

<http://www-thphys.physics.ox.ac.uk/people/JosephConlon/LectureNotes/SUSYLectures.pdf>
"Introduction to Supersymmetry" by Joseph Conlon, 2010

In terms of Fredkin's Digital Philosophy, a plausible slogan is: "A complete infinity is either a mathematical convenience or a physical mistake." If supersymmetry is an approximate symmetry within Wolfram's automaton then string theorists have false confidence in their contemporary paradigm.