Is nature finite and digital? How can physicists perform a decisive test of the hypothesis that nature is finite and digital? Is M-theory with the finite nature hypothesis the ultimate theory of nature? Is M-theory the only plausible way to unify quantum field theory and general relativity theory? What is the main problem with M-theory? If X is to M-theory as Kepler's Laws are to Newtonian theory, then what is X? Can M-theorists discover a computational method for M-theory leading to valid empirical predictions? A computational method for M-theory might take the form of a Markov branching process or a finite, deterministic automaton. M-theory should perhaps explain dark matter, dark energy, the free parameters of the Standard Model of particle physics, and the space roar. Consider the following:

MILGROM DENIAL HYPOTHESIS: The main problem with M-theory is that M-theorists fail to realize that Milgrom is the Kepler of modern cosmology.

How can Milgrom's work be approximately compatible with Newtonian and Einsteinian gravitational theory? Physicists might say the equivalence principle has been verified to 14 decimal place of accuracy, but the verification is only for real energy because measurement of virtual energy causes manifestation as real energy. Is Einstein's equivalence principle true for virtual mass-energy? Does Milgrom's work imply that the equivalence principle is true for real mass-energy but false for virtual mass-energy?

Consider the following hypotheses:

(1) Nature is finite and digital. (This hypothesis is due to Zuse and Fredkin.)

(2) The multiverse consists of a huge, but finite, number of universes.

(3) Universes are arranged in coupled pairs consisting of a matter universe with an antimatter universe.

(4) The maximum physical wavelength is the Planck length times the Fredkin-Wolfram constant.

(5) The multiverse consists of a Wolframian automaton spread across alternate universes.

(6) Time, space, and energy are approximations generated by the Wolframian automaton with a Wolframian updating parameter that requires a huge number of updates to create one Planck time interval.

(7) The Wolframian automaton operates on each universe by means of a Fredkin delivery machine and a Nambu transfer machine; these two machines require the success of Wolfram's project for their definitions. The Fredkin delivery machine generates Nambu digital data from Fredkin-Wolfram information below the Planck scale. The Nambu transfer machine takes Nambu digital data and generates approximations to quantum field theory and general relativity theory by means of a smoothing process involving M-theory.

(8) The percentage of dark energy remains constant over cosmological time, but the percentage of dark matter increases over cosmological time as the percentage of ordinary matter decreases.

(9) During each Planck time interval, each universe converts one Fredkin-Wolfram energy unit of real mass-energy into one Fredkin-Wolfram energy unit of virtual mass-energy.

(10) The multiverse recycles according to a fixed recycling time of approximately 81.6 billion years.

(11) When an expanding universe becomes cold enough, then it undergoes an instantaneous (i.e., one Planck time interval) collapse into a big bang.

(12) Virtual mass-energy remains spread over alternate universes, but the Wolframian automaton localizes real mass-energy in the particular universe that contains the explicit or implicit observation of the real mass-energy. Real mass-energy obeys the equivalence principle. Dark matter is virtual mass-energy that has positive gravitational mass-energy and zero inertial mass-energy. Dark energy is virtual mass-energy that has negative gravitational mass-energy and zero inertial mass-energy.

How might the preceding speculative hypotheses be confirmed or refuted? The hypotheses suggest the following:

(A) The % of dark matter + the % of standard matter remains constant over spans of cosmological time. Let (20 + A) % denote this constant %.

(B) The % of dark energy remains constant over spans of cosmological time. Let (70 + B) % denote this constant %.

(C) The % of standard matter decreases over spans of cosmological time according to the formula: % of standard matter at time T = (20 + A) * (1 - (T/ (81.6 billion years))) %, where T is the age of the universe and T is less than 80 billion years.

(D) The % of dark matter increases over spans of cosmological time according to the formula: % of dark matter at time T = (20 + A) * (T/(81.6 billion years)) %, where T is the age of the universe and T is less than 80 billion years.

Precise astronomical data allows the approximate calculation of the constants A, B.

.0456 ± .0015 is the % of baryon density.

.228 ± .013 is the % of dark matter. By addition, we see that

.2736 ± .0145 is the supposedly constant % hypothesized. (That is, A = 7.36, where A + B = 10.)

Observe that 6 times (.0456 ± .0015) equals .2736 ± .009 — thus indicating to 2 decimal places of accuracy that the preceding hypotheses (1) through (12) together explain space roar. The % of dark matter was much lower in the very early universe so naturally there was a greatly increased % of electromagnetic noise — in fact about 6 times as much noise. However, much more might be true. Consider the following:

SPACE ROAR PROFILE PREDICTION: For cosmological radio emissions in the centimeter range, if T represents the age in billions of years of the universe at the time of the radio emission and if T < 6.5 billion years, then space roar increases as T decreases according to the formula:

Space_roar(T) = (% of standard matter at time T)/(% of standard matter now) = (27.36 * (1 - (T/(81.6 billion years))))/(4.56).

What if the preceding prediction is wrong? Because of mathematical facts, are there only 2 plausible possibilities for a multiverse model: (1) M-theory with the infinite nature hypothesis or (2) M-theory with the finite nature hypothesis? What should M-theory explain? Is the GZK paradox explained by inverse Compton scattering from relativistic jets?

http://en.wikipedia.org/wiki/Lambda_CDM_model

http://en.wikipedia.org/wiki/Space_roar