Does each superstring have 24 D-brane charges? Is the Leech lattice essential for understanding the foundations of physics? Why does time exist? Why does space exist? Why does energy exist? Is there a valid cellular automaton approach to the foundations of physics?

According to 't Hooft, "We claim that our observations add a new twist to discussions concerning the interpretation of quantum mechanics, which we call the cellular automaton (CA) interpretation."

http://arxiv.org/pdf/1207.3612v2.pdf "Discreteness and Determinism in Superstrings" by G. 't Hooft, 2012

In reference to t' Hooft's article "Discreteness and Determinism in Superstring", Motl made the following statement, "Quantum mechanics plays an essential role in string theory both on the world sheet and spacetime. Without quantum mechanics, the spectrum of particles wouldn't be discrete, the conformal symmetry and modular invariance wouldn't work. Dualities wouldn't exist, unitarity would break, all hell would break loose.

The same applies to continuity (i.e. non-discreteness) of the worldsheet variables that are essential for conformal symmetry which is essential for consistency as well, and so on. The paper is complete garbage."

http://motls.blogspot.co.uk/2012/07 Motl's blog "The Reference Frame", Tuesday, July 17, 2012, "Diversity of observables in quantum mechanics" (comments section)

I say that Motl makes an excellent point. There are only two possibilities: (1) 't Hooft's CA work is either wrong or irrelevant or (2) 't Hooft's CA interpretation of quantum mechanics is correct and, at least in terms of string theory, all hell breaks loose WITH TESTABLE PREDICTIONS. Without continuity of the worldsheet variables, ruined conformal symmetry would wreck the consistency of geometric string theory and bizarre things should happen: LIKE THE FAILURE OF THE EQUIVALENCE PRINCIPLE. I say that the main problem with string theory is that string theorists fail to realize that Milgrom is the Kepler of contemporary cosmology. There is overwhelming empirical evidence in favor of Milgrom's non-relativistic MOND.

http://astroweb.case.edu/ssm/mond/ "The MOND pages" by Stacy McGaugh

http://vixra.org/pdf/1207.0049v1.pdf "Gravity Probe B and the Rañada-Milgrom Effect"

http://vixra.org/pdf/1301.0014v1.pdf "Does Superstring Snapping Explain Dark Matter and Dark Energy?"

http://vixra.org/pdf/1301.0034v1.pdf "Does Supersymmetry Resolve the GZK Paradox?"

I claim that replacing the -1/2 in the standard form of Einstein's field equations by (-1/2 + sqrt((60±10)/4) * 10^-5) is not only empirically correct, but also a new chapter in string theory — am I wrong? Most supposedly revolutionary, radically new ideas are miserable failures, but Milgrom has the empirical evidence on his side. Is D-brane theory compatible with the alleged Fernández-Rañada-Milgrom effect?

According to Wikipedia, "In theoretical physics, Ramond–Ramond fields are differential form fields in the 10-dimensional spacetime of type II supergravity theories, which are the classical limits of type II string theory. The ranks of the fields depend on which type II theory is considered. As Joseph Polchinski argued in 1995, D-branes are the charged objects that act as sources for these fields, according to the rules of p-form electrodynamics. It has been conjectured that quantum RR fields are not differential forms, but instead are classified by twisted K-theory."

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

According to Wikipedia, "In theoretical physics, one often analyzes theories with supersymmetry in which superfields play a very important role. A superfield is a function defined in superspace which properly packages the various fields of a supermultiplet, namely, the array of fermion and boson fields related among themselves by supersymmetry."

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

According to E. Scheidegger, "The realization that, apart from strings, there are further basic, dynamical objects in string theory, namely D-branes, has initiated a revolution in the understanding of this theory. These D-branes are objects on which open strings can end and their nature is non-perturbative in the closed string sector. They are extended objects of any dimension $p < 10$. The massless modes of the open strings ending on them define a gauge theory on their world-volume. The low-energy limit of this world-volume theory is the dimensional reduction of N=1 Super-Yang-Mills theory in ten dimensions down to p+1 dimensions."

http://www.aei.mpg.de/pdf/doctoral/EScheidegger_01.pdf "D-branes on Calabi-Yau spaces" by E. Scheidegger, doctoral disseration, July 2001

If D-branes are the charged objects that act as sources for the RR fields, then how many D-brane charges might a superstring have? The Leech lattice has dimension 24, so the number 24 might be a good candidate for the answer to the preceding question.

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

Why should the Leech lattice be essential for understanding the foundations of physics? What is the main problem with string theory? What might be falsifiable predictions that can convince all physicists that string theory is empirically valid? According to Michael R. Douglas, "Even if we find no "smoking gun" for or against

the theory, there is a program which could someday lead to falsifiable predictions. It is to understand the landscape of string vacua, and derive a probability measure on a set of vacua based on quantum cosmology."

http://arxiv.org/pdf/1204.6626v2.pdf "The string landscape and low energy supersymmetry" by M. R. Douglas, 2012

How might string theorists derive a probability measure on the set of string vacua in the string landscape? Does the string landscape actually occur in nature? Is 't Hooft's cellular automaton (CA) approach the way to proceed? 't Hooft conjectures that "Beyond Superstring Theory, there is something really simple … it is conceptually simple, but mathematically hard …"

http://www.ccsem.infn.it/issp2012/docs/discrete_superstring.pdf "Beyond Relativistic Quantum String Theory or Discreteness and Determinism in Superstrings" by Gerard 't Hooft, Erice, June 27 and July 1, 2012

According to 't Hooft, "a deterministic cellular automaton in one space- and one time dimension can be mapped onto a bosonic quantum field theory on a 1+1 dimensional lattice. We now also show that a cellular automaton in 1+1 dimensions that processes only ones and zeros, can be mapped into a fermionic field theory in a similar way."

http://arxiv.org/pdf/1207.3612v2.pdf "Discreteness and Determinism in Superstrings" by 't Hooft, 2012

In the preceding paper, 't Hooft has "A New Kind of Science" as reference #7. In my opinion, a cellular automaton below the Planck scale uses Fredkin time, Fredkin distance, and Fredkin digit transition so that care needs to be used when discussing energy and quantum states below the Planck scale. Also, the word "classical" should perhaps be replaced by "para-classical". A finite automaton operating in 10 dimensions, or more, might not be "classical". I think that, so far, 't Hooft has ignored 3 important questions:

Is Milgrom the Kepler of contemporary cosmology? Is sqrt(mass) = area? Is the space roar essential for understanding the foundations of physics?

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

Is the space roar extremely relevant to the following 3 bizarre conjectures?

CONJECTURE (A): Time exists because 2^46 divides the order of the monster group.

CONJECTURE (B): Space exists because 3^20 divides the order of the monster group.

CONJECTURE (C): Energy exists because the monster group and the six pariah groups allow D-brane gravitation and D-brane charge force to provide symmetries

for a stable, oscillating multiverse that runs on a synchronized big-bang cycle of 81.6 billion years (± 1.7 billion years).

If nature is infinite then are conjectures (A), (B), (C) wrong? Yes, because the infinite nature hypothesis makes it extremely unlikely that nature has a mechanism for transferring energy from the boundary to the interior of the multiverse. If nature is finite, then geometric string theory has severe mathematical problems. However, 't Hooft's approach, if combined with the monster group, might salvage string theory combined with conjectures (A), (B), (C). The order of the monster group is

2^46 · 3^20 · 5^9 · 7^6 · 11^2 · 13^3 · 17 · 19 · 23 · 29 · 31 · 41 · 47 · 59 · 71.

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

My guess is that without the mathematics of the monster group there would be no logical possibility for a physical system that allows a system of chemistry and biology to exist. If matter time and antimatter time exist, then 2^23 and 3^10 might somehow represent symmetries with respect to time and space governed by the monster group. The 23 would represent the 24 dimensions of the Leech lattice minus 1 dimension for boundary conditions. The 10 would represent the 10 dimensions of the field equations for general relativity theory. Thus, time and space might exist because there are many symmetries within the monster group corresponding to group elements of order 2 or 3 or, perhaps, group elements of order 2^m or 3^n, for some positive integers m, n. D-brane gravitation might hold the multiverse together, while D-brane charge-based force might prevent D-brane gravitational collapse of the multiverse. There might be three different times: ephemeris time, atomic time, and nonmeasurable superstring time. The equivalence principle might fail because ephemeris time and atomic time are not 100% in agreement, and this failure would be empirical evidence that gravitational energy is drained from the boundary of the multiverse into the interior of the multiverse during the expansion phase of the synchronized big bangs. The hypothetical synchronization of the big bangs would be with respect to nonmeasurable superstring time. If you ask me how this scenario might be tested, then my answer is: the alleged Fernández-Rañada-Milgrom effect and the space roar profile prediction. Consider the conjectures (D), (E), (F):

CONJECTURE (D): Each superstring has 24 D-brane charges in a higher-dimensional superfluid with 3 energy-density levels vibrating with respect to 3 distinct copies of the Leech lattice.

CONJECTURE (E): AdS = CFT has a physical interpretation consisting of a 72-ball that undergoes vibrations and oscillations with respect to a nonmeasurable superstring time.

CONJECTURE (F): Nature is finite and digital. (This hypothesis is due to Konrad Zuse and Edward Fredkin.)

Is it possible that conjectures (D), (E), (F) might be tested by predicting some of the free parameters of the Standard Model? My guess is that 't Hooft's CA interpretation of quantum mechanics can be developed to yield such predictions. The finite nature hypothesis and 't Hooft's CA interpretation are so restrictive that there might be a unique model of physics compatible with those two radical ideas. The finite nature hypothesis might be philosophically correct, but empirically meaningless, i.e., without testable consequence. Mathematically, string theory is fundamentally correct so that string theory is likely to be the mathematics of quantum gravity theory. According to Davis, Brax, and van de Bruck, "Brane inflation is the most promising string-motivated model of cosmological inflation."

http://rsta.royalsocietypublishing.org/content/366/1877/2833.full "Brane inflation and defect formation" by A.-C. Davis, P. Brax, and C. van de Bruck, 2008

String theorists need to realize that string theory should explain dark matter, dark energy, cosmological inflation, and also non-relativistic MOND, because MOND is as empirically valid as dark matter, dark energy, and inflation.

According to Jacob Bekenstein, "The modified newtonian dynamics (MOND) paradigm of Milgrom can boast a number of successful predictions regarding galactic dynamics; these are made without the assumption that dark matter plays a significant role. MOND requires gravitation to depart from Newtonian theory in the extragalactic regime where dynamical accelerations are small."

http://arxiv.org/pdf/astro-ph/0403694v6.pdf "Relativistic gravitation theory for the MOND paradigm" by Jacob D. Bekenstein, 2005

Bekenstein's TeVeS might be wrong (I am guessing it is indeed wrong), but Bekenstein is correct that MOND shows that one of two possibilities holds:

(1) Newton-Einstein gravitational theory is 100% correct but appears to wrong for some unknown reason.

(2) Newton-Einstein gravitational theory is significantly wrong.

Am I wrong on this point? No, because McGaugh and Kroupa have the empirical evidence to back me up on this particular point. McGaugh wrote, "To my growing incredulity, each observation that was puzzling in the context of dark matter turned out to be confirmation of one of Milgrom's long standing predictions."

http://www.astro.umd.edu/~ssm/darkmatter/LCDMriff.html "Through a Universe Darkly" by S. McGaugh, University of Maryland

Have string theorists underestimated Milgrom and 't Hooft? String theorists have PERHAPS correctly judged 't Hooft's CA interpretation of quantum mechanics, but string theorists have definitely underestimated Milgrom's non-relativistic MOND. My guess is that 't Hooft's superstring determinism theory is the only way to get a satisfactory model for MOND. If nature is infinite, then nature might lack

synchronization of superstring vacua. Without such synchronization, brane interactions might be unpredictable in terms of cosmology. Thus, my guess is that there are two possibilities: (1) ‘t Hooft’s superstring determinism is empirically valid, or (2) the string landscape and the anthropic principle are the zenith for predictions from string theory. How can string theory explain dark matter and dark energy? Are there 11 basic string waves: 3 representing pitch, 4 representing roll, and 4 representing yaw? Why does time exist? Why does space exist? Why does energy exist? Are there satisfactory answers to the 3 preceding questions if and only if nature is finite?