Does superstring snapping explain dark matter and dark energy? Does superstring snapping combined with discreteness and determinism in superstrings make testable predictions?

According to 't Hooft, "With discrete degrees of freedom one can construct Hilbert space in a quite natural way by postulating that any state of the physical degrees of freedom corresponds to an element of this Hilbert space. Reversibility in time is required if we wish to see a quantum superposition principle; the norm of all states is then preserved if they are quantum superpositions of these basis elements."

http://arxiv.org/pdf/gr-qc/9310026v2.pdf "Dimensional Reduction in Quantum Gravity" (version 2, page 2) by G. 't Hooft, 2009

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

I have made two testable predictions: the alleged Fernández-Rañada-Milgrom effect and the space roar profile prediction. Is ephemeris time significantly different from atomic time? According to Fernández-Rañada and Tiemblo, "not all of the dynamical clock-times are necessarily equivalent and … the observational fingerprint of this nonequivalence has, curiously, the same form as that of the Pioneer anomaly."

http://www.nrcresearchpress.com/doi/pdf/10.1139/p2012-086 "Parametric Invariance and the Pioneer Anomaly" – Canadian Journal of Physics, 2012

http://www.ucm.es/info/electron/publicaciones/ranada/Ranada_Tiemblo_Dynamical_time-v3-20Dec2011-Finaltext.pdf "Parametric invariance and the Pioneer anomaly" by A. Fernández-Rañada and A. Tiemblo, 2011

Consider the following conjecture: Based upon the ideas of Fernández-Rañada and Tiemblo, the -1/2 in the standard form of Einstein's field equations should be replaced by -1/2 + F(fundamental tensor, energy tensor, parameters from quantum gravity), where F is a positive function that is very small with respect to 1/2.

What is the likely implication of combining the preceding conjecture with non-relativistic MOND (Modified Newtonian Dynamics)?

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

I claim that the -1/2 in the standard form of Einstein's field equations should be replaced by -1/2 + dark-matter-compensation-constant, where this constant is approximately (-1/2 + sqrt((60±10)/4) * 10^-5). My analysis assumes that the 2012 statistical analysis for the Pioneer anomaly by Turyshev et al. is fundamentally wrong. In any case, as pointed out by Fernández-Rañada and Tiemblo, two other spaceships, Galileo and Ulysses, give similar estimates.

In July 2012, Turyshev et al. published a paper "Support for the thermal origin of the Pioneer anomaly" in "Physical Review Letters" that claims that there no Pioneer anomaly within the statistical error for thermal recoil and other unknown effects in the Pioneer data. According to Turyshev et al., "We investigate the possibility that the anomalous acceleration of the Pioneer 10 and 11 spacecraft is due to the recoil force associated with an anisotropic emission of thermal radiation off the vehicles. To this end, relying on the project and spacecraft design documentation, we constructed a comprehensive finite-element thermal model of the two spacecraft. Then, we numerically solve thermal conduction and radiation equations using the actual flight telemetry as boundary conditions. We use the results of this model to evaluate the effect of the thermal recoil force on the Pioneer 10 spacecraft at various heliocentric distances. We found that the magnitude, temporal behavior, and direction of the resulting thermal acceleration are all similar to the properties of the observed anomaly. As a novel element of our investigation, we develop a parameterized model for the thermal recoil force and estimate the coefficients of this model independently from navigational Doppler data. We find no statistically significant difference between the two estimates and conclude that once the thermal recoil force is properly accounted for, no anomalous acceleration remains."

I claim that Turyshev et al. have combined supreme excellence in physics and computer modeling with a basic fallacy in statistical analysis. When performing a statistical analysis, the statisticians should decide what is the main point of the statistical analysis. There should be a null hypothesis versus an alternative hypothesis, or a series of null hypotheses versus alternative hypotheses. Tests are done and statisticians accept or reject hypotheses with statistical degrees of certainty. On p. 3 of their article, Turyshev et al. make the following statement:

"The RTGs were coated with "three mils of zirconia … in a sodium silicate binder". No information is available in the literature about this particular type of paint when exposed to solar radiation, especially when exposed to solar radiation at the relatively high temperatures present on the RTG outer surfaces. Similar paints have experienced both an increase and a decrease of up to 5% in infrared emissivity. Approximately 25% of the RTG coated surfaces were exposed to solar irradiation. A calculation that takes into account the relative contribution of RTG heat to the total anisotropy yields a corresponding error figure of 25% in the overall energy budget."

I claim that the preceding statement is a blatant example of the statistical fallacy of assuming the alternative hypothesis based upon the null hypothesis that "This particular type of paint exhibited no statistically significant increase or decrease in infrared emissivity." The error consists of assuming a worst case scenario and incorporating this assumption into analysis the without a quantitative statistical justification. In essence, Turyshev et al. have begged the question and disguised this begging of the question within a careful and accurate computer model of the empirical data. My guess is a realistic computer model of such emissivity effects would yield an error figure of drastically less than 25%, but in any case I claim that Turyshev et al. have committed an error in statistical analysis.

http://arxiv.org/pdf/1204.2507v1.pdf "Support for the thermal origin of the Pioneer anomaly"

Is Newton-Einstein gravitational theory significantly wrong? Is Milgrom the Kepler of contemporary cosmology? Does the finite nature hypothesis challenge many fundamental assumptions in physics?

According to Goffinet, "One of the main drawbacks of grand unification theories is the introduction of new gauge bosons which, in general, break up the lepton and baryon numbers and therefore allow the proton to decay. The current measurement settles firm constraints and has ruled out many of them including the original SU(5). Another drawback, aesthetic this time, is related to the breaking of the grand unification group. Usually this breaking requires several Higgs representations which imply a rather complex scalar sector with many physical scalar particles."

http://cp3.irmp.ucl.ac.be/upload/theses/phd/goffinet.pdf "A bottom-up approach to fermion masses", 2008 doctoral thesis by François Goffinet

If nature is finite and digital, then could such a natural property solve many problems connected with the grand unification group? Is it possible to refute superstring theory? No, because the string landscape and contrived brane interactions can provide models for any plausible, or implausible, physics.

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

What are the 3 main predictions of M-theory? The answer might be gravity, gauge/gravity duality, and supersymmetry.

http://www.sns.ias.edu/~witten/papers

According to Witten, supersymmetry is "a new symmetry structure of elementary particles in which quantum variables are incorporated in the structure of space-time. The new symmetry prevents the particle interactions that would make the Higgs particle mass too big but, again, predicts a host of additional new particles that might be discovered at the LHC, and perhaps at the Tevatron."

http://www.sns.ias.edu/~witten/papers/Symmetry.pdf "When symmetry breaks down" by Edward Witten, 2004

Is supersymmetry considerably different in a finite multiverse as opposed to an infinite multiverse? Consider three beliefs about the foundations of physics:

(A) The equivalence principle is 100% empirically valid.

(B) The universe is infinite.

(C) Supersymmetry predicts many new particles.

My guess is that the work of Milgrom, McGaugh, and Kroupa refutes belief (A).

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

http://www.astro.uni-bonn.de/~pavel/kroupa_cosmology.html Pavel Kroupa: Dark Matter, Cosmology and Progress website

I am also guessing that the space roar refutes belief (B) and suggests that the multiverse recycles in approximately 81.6 billion years (± 1.7 billion years).

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

In connection with belief (C), my guess is that supersymmetry with the finite nature hypothesis might predict one and only one new particle: a "combined sfermion" with spin 1/2 that travels at the speed of light. Are beliefs (A), (B), and (C) highly plausible? Yes, and perhaps all three of them are correct.

What is the physical meaning of AdS = CFT?

According to Maldacena, "The gauge/gravity duality is an equality between two theories: On one side we have a quantum field theory in d spacetime dimensions. On the other side we have a gravity theory on a d+1 dimensional spacetime that has an asymptotic boundary which is d dimensional. It is also sometimes called AdS/CFT, because the simplest examples involve anti-de-Sitter space and conformal field theories. It is often called gauge-string duality. This is because the gravity theories are string theories and the quantum field theories are gauge theories. It is also referred to as "holography" because one is describing a d+1 dimensional gravity theory in terms of a lower dimensional system, in a way which is reminiscent of an optical hologram which stores a three dimensional image on a two dimensional plate. It is called a "conjecture", but by now there is a lot of evidence that it is correct. In addition, there are some derivations based on physical arguments."

http://arxiv.org/pdf/1106.6073v1.pdf "The gauge/gravity duality" by Juan Maldacena, 2011

According to Horowitz and Polchinski, "The AdS/CFT system is entirely embedded in the framework of quantum mechanics. On the gauge theory side we have an explicit Hamiltonian and states we can think of as gauge invariant functionals of the fields. Thus the gravitational theory on the other side is quantum mechanical as well. In particular the metric fluctuates freely except at the AdS boundary. One is not restricted to perturbations about a particular background."

http://arxiv.org/pdf/gr-qc/0602037.pdf "Gauge/gravity duality" (p. 10) by Gary T. Horowitz and Joseph Polchinski, 2006

According to Polchinski, "… Maldacena's equation AdS = CFT contains all the central concepts of fundamental physics: Maxwell's equations to start with, and their non-Abelian extension, plus the Dirac and Klein-Gordon equations, quantum mechanics, quantum field theory and general relativity. Moreover, in addition to these known principles of nature, it contains several more that theorists have found appealing:

supersymmetry, string theory, and extra dimensions, and it ties all of these together in an irreducible way."

http://arxiv.org/pdf/1010.6134v1.pdf "Introduction to Gauge/Gravity Duality" by Joseph Polchinski, 2010

What is the geometry of the multiverse? Is the problem of geometrizing Feynman diagrams closely related to the question of how nature constrains superstring vibrations? Does the Leech lattice constrain superstring vibrations?

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

Does superstring snapping provide the flow of time in a holographic multiverse? Is the unobserved portion of the multiverse, from the QFT viewpoint, similar to a hologram with an infinite number of dimensions? Is the multiverse similar to a quantum lattice of quantum lattices?

Here are 3 of my main ideas:

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

WOLFRAM'S COSMOLOGICAL HYPOTHESIS: The maximum physical wavelength is the Planck length times the Fredkin-Wolfram constant.

PHYSICS LEVELS HYPOTHESIS: There are 4 fundamental levels of physics:

LEVEL 1. Newtonian mechanics and classical electromagnetic field theory;

LEVEL 2. Quantum field theory and general relativity theory;

LEVEL 3. Geometric string theory;

LEVEL 4. Lattice string theory with the finite nature hypothesis.

What might the preceding hypotheses imply? Consider the following conjectures (D), (E), and (F):

CONJECTURE (D) The "combined sfermion" conjecture: Bosons and fermions are never unified except at the level of virtual energy. Supersymmetry with the finite nature hypothesis predicts that the graviton is the superpartner of the "combined sfermion" and that the "combined sfermion" is the only superparticle found in nature. The "combined sfermion" has spin 1/2, travels at the speed of light, and is the explanation for the GZK paradox. The "combined sfermion" is involved in the following gravitational energy transfers:

(1) SUPERSTRING SNAPPING DURING THE BIG BANG EXPANSION:

superstring —> (gravitational energy transferred from the boundary to the interior of the multiverse) + "combined sfermion"

(2) SUPERSTRING RESNAPPING DURING THE BIG STOP TO THE BIG BANG:

"combined sfermion" —> superstring + (gravitational energy transferred from the interior to the boundary of the multiverse)

CONJECTURE (E) The superstring gravitational cycle conjecture: Nature is finite and digital with superstring determinism running on a cycle of 81.6 billion years (±1.7 billion years). The cycle runs by transferring gravitational energy from the boundary to the interior of the multiverse in the expansion phase of the synchronized big bangs. During the synchronized big stops to the big bangs, all the gravitational energy lost by the boundary is regained. During the synchronized cosmological inflation of the big bangs, all of the cosmological inflation occurs during one Planck time interval. The first Planck time interval consists of SU(5) (or SO(10)) physics with all bosons consisting of gravitons and with all fermions consisting of a "combined sfermion" that has spin 1/2 and travels at the speed of light. After the first Planck time interval, all cosmological inflation ceases. The second and subsequent Planck time intervals consist of SU(3) X SU(2) X U(1) physics. The big bang is identical to the big stop to the big bang with SU(5) (or SO(10)) physics and with gravitons and "combined sfermions" at their maximum energy density. The interior of the multiverse consists of SO(64) physics. Dark energy is direct evidence for superstring snapping, i.e., D-brane noise accompanying transfer of gravitational energy from the boundary to the interior of the multiverse. Because superstrings are under enormous tension, they sometimes snap and cool off, thus creating an excess of quantum vacuum and a deficiency of gravitational attraction in each particular universe. Dark matter is indirect evidence for superstring snapping, i.e., D-brane reinforcement of the gravitational signal in the form of excess gravitational redshift. The dark energy of all the alternate universes causes dark matter to be observed in each particular universe.

CONJECTURE (F) The 72-ball conjecture: There is an approximate quantum field theory in 71 spacetime dimensions linked to the monster group and the six pariah groups. The 71 dimensions are needed to accommodate all the group symmetries from the 26 sporadic groups. There is an approximate gravitational theory in 72 spacetime dimensions. The smoothing of Wolfram's mobile automaton is somewhat similar to a huge 72-ball with a vast number of tiny alternate universes on its boundary, which is approximately a 71-sphere with many tiny bubbles representing alternate universes. The alternate universes are arranged in pairs with matter time in one member of the pair and with antimatter time in the other member of the pair. All of the alternate universes remain on the boundary and are informationally bound together through the interior of the 72-ball. The 72-ball undergoes a perpetual cycle of cooling and reheating of the boundary. The passage of time occurs because of superstring snapping. A superstring is either shared between the boundary and the interior or else localized to one particular alternate universe. If a shared superstring snaps then it cools off and becomes localized to one particular alternate universe. This superstring snapping process creates an excess of quantum vacuum. Superstring snapping occurs at a constant rate and explains the nonzero

cosmological constant, which might also be called “D-brane noise”. The superstring snapping process also explains the fact that the dark-matter-compensation-constant is nonzero. A snapped string localized to one particular alternate universe reinforces the gravitational signal found in all the alternate universes. Thus string snapping cause “D-brane reinforcement of the gravitational signal”, i.e., a uniform excess of gravitational redshift interpreted as dark matter. There are 2 fundamental speeds in the multiverse: c, the speed of light in a vacuum found in each alternate universe, and C, the speed of light in the interior of the multiverse. All of the alternate universes are located on the boundary of the 72-ball geometry of the multiverse. The interior of the 72-ball is an ultra-hot ultra-vacuum with a speed C which is enormously greater than the speed c. Virtual mass-energy is shared between the boundary and the interior of the 72-ball. Real mass-energy is localized to some particular alternate universe on the boundary of the 72-ball. If nature were not finite, then the speed C would be infinite and the interior of the 72-ball would have zero energy-density. The interior of the 72-ball contracts as the synchronized big bangs of the alternate universes expand. When the big bangs reach their maximum expansion in about 81.6 billion years (± 1.7 billion years) then the synchronized big stops to the big bangs occur in precisely one Planck time interval. During the synchronized big bang singularities, the interior of the 72-ball recovers all of the virtual energy that it has lost during the expansion phase, and the interior of the 72-ball expands to its maximum diameter in precisely one Planck time interval. The M-theoretical fundamental domain is 11-dimensional because there are 11 basic superstring waves that periodically vibrate on a lattice consisting of (Leech lattice) <DIRECT SUM> (Leech lattice) <DIRECT SUM> (Leech lattice). D-brane gravitation controls the expansions and contractions of the boundary and interior of the 72-ball. Unified D-brane electromagnetism with 24 D-brane charges explains the Standard Model of particle physics. There are 3 generations of particles because there are 3 distinct energy-density levels in the fundamental lattice structure of the multiverse. The Standard Model exists because there are 26 sporadic groups.

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

Is the “72-ball hypothesis” completely wrong? Perhaps so, but why have string theorists failed to explain dark energy? What is the physical meaning of AdS = CFT in terms of dark matter and dark energy?