TITLE: Is Christian's Parallelized 7-sphere Model Essential for the Physical Interpretation of M-theory?

"In the frontier of science, sometimes there is no difference between science and religion. People have their beliefs, and they will tell you that their prophet is better than your prophet." — Dan Shechtman

http://www.youtube.com/watch?v=oa1GMwXuBwo "The Discovery of Quasicrystals – Dan Shechtman - YouTube"

"The time will come, however, when it will be evident to everyone that I have been right." — Joy Christian, 2012

What might Christian's theory (with the infinite nature hypothesis) imply in terms of (1) astrophysics, (2) particle physics, and (3) condensed matter physics?

(1) Rañada-Milgrom effect; black holes correctly modeled by M-theory;

(2) no superpartners; Higgs field exists in some form;

(3) 11-dimensional physical reality experimentally verified in superconductivity and superfluidity.

J. Christian claims that the familiar quantum states with complex numbers (quantum SU(1) states) should be replaced by quantum SU(8) states based upon octonions. Are octonions needed for the physical interpretation of M-theory? There might be 5 most fundamental theories in physics: (1) Newtonian mechanics, (2) classical field theory based on Maxwell's equations, (3) quantum field theory, (4) general relativity theory, and (5) M-theory. How might the paradigm of M-theory go beyond the paradigm of quantum field theory?

Joy Christian has presented ideas that fundamentally challenge the widely accepted paradigms of quantum theory. The Copenhagen interpretation and Christian's theory of local realism might lead to different interpretation of physical events. Let me quote from Christian's "On the Origins of Quantum Correlations" (p. 17): "... the torsion within the 7-sphere continuously varies from one point to another within the manifold. It is the variability of the parallelizing torsion within S^7 that is intimately responsible for the diversity and non-linearity of the quantum correlations we observe in nature."

http://arxiv.org/pdf/1201.0775v4.pdf "On the Origins of Quantum Correlations"

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

Bell theorem plays a significant role in the Copehagen interpretation.

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

J. Christian makes the puzzling claim that he has disproved Bell's Theorem. I claim that Joy Christian has made this mistake: If quantum phenomena contradict

Maxwell's equations, then I do not say that Maxwell's equations are wrong. If bizarre new M-theoretical phenomena contradict the CURRENTLY ACCEPTED FORM of Bell's theorem, then I do not say that Bell's theorem is wrong. Bell's theorem is valid within the paradigm in which the Copenhagen interpretation works, and the Copenhagen interpretation MIGHT sometimes fail, causing the failure of Bell's theorem as a consequence. Christian's statement of his Theorem Egregium is very confusing to people. Christian has made the bad mistake of redefining the terms "quantum correlation" and "local realism" by means of his own concepts — this has created confusion and miscommunication. Should Christian's ideas be explained in terms of superstring theory? Does going beyond the Copenhagen interpretation require the unification of quantum field theory and general relativity theory? Does such unification require superstring theory?

"I don't think that it has ever happened that a theory that has the kind of mathematical appeal that string theory has has turned out to be wrong. … And in any case I don't see any alternative to string theory. I don't see any other way of bringing gravity into the same general theoretical framework as all the other forces of nature." — Steven Weinberg

http://www.pbs.org/wgbh/nova/elegant/view-weinberg.html

"String theory doesn't have any competitors really." — Andrew Strominger, 2012 Berkeley colloquium

http://physics.berkeley.edu/events/Colloquia/movies/col.streaming.3-12-12.mov

String theory unites gravity and quantum field theory, and mathematicians admire the mathematics of string theory. If string theory is so great, then why is there, as yet, no convincing physical interpretation of string theory? The string theorists had 5 different models that Witten united to create M-theory, but where are M-theory's empirical verifications?

http://en.wikipedia.org/wiki/M-theory

Does nature provide a deterministic flow of information that explains M-theory? Bell's theorem suggests that quantum field theory is inherently nonlocal. Bell's Theorem is part of the foundations of quantum information processing and the study of quantum entanglement.

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

J. Christian of Oxford claims to have disproved Bell's theorem.

From Joy Christian's 2009 Azores talk:

(1) "Bell did not respect the original EPR argument correctly."

(2) "Now, I am skipping about thirty-pages of calculations."

(3) " … you can reproduce quantum mechanics locally and realistically …"

http://www.youtube.com/watch?v=J2Sc0ZvNMe4 (Joy Christian: Disproof of Bell's Theorem", FQXi Azores Conference 2009)

The ideas presented here represent Brown's concepts of what Christian ideas mean in terms of M-theory and the future of physics. The reader should directly consult Christian's papers on arXiv.org to understand Christian's ideas.

http://arxiv.org/find/all/1/au:+Christian_Joy/0/1/0/all/0/1

Christian of Oxford and the Perimeter Institute has published from 2007 to 2012, a series of papers indicating that BELL'S THEOREM IS ACTUALLY FALSE BECAUSE THE COPENHAGEN INTERPRETATION IS NOT ENTIRELY TRUE. In other words, Bell's Theorem is true within the scope of the Copenhagen interpretation, but some weird M-theoretical phenomena can sometimes violate the Copenhagen interpretation.

Christian has written down his ideas in a rather unsatisfactory way. Christian should have done 3 things: (1) Write down something like, "If you don't have a thorough understanding of teleparallel gravity, then you don't have the background to understand what I am writing down." (2) Carefully separate the physics part of his work from the mathematics part, and explain exactly how he is trying to replace the Copenhagen interpretation by the Christian interpretation based upon his parallelized 7-sphere model. (3) Explain precisely what he is predicting, what he is not predicting, and what the parallelized 7-sphere model means in terms of experimental physics. Am I wrong in my understanding of what Christian is doing? Perhaps so. I claim that Christian has reformulated PART OF M-theory and that his work implies that 11-dimensional knot theory should be fully displayed in terms of experiments in D-wave superconductivity. What is the contemporary state of knowledge about knots in superconductors?

http://gow.epsrc.ac.uk/NGBOViewGrant.aspx?GrantRef=EP/G009678/1 "Knot Solitons in Superconductors? A definitive test of the Babaev-Faddeev-Niemi Hypothesis"

The hypothetical BFN knot solitons are 4-dimensional. My guess is that Christian's (quantum SU(8) state)/(Theorema Egregium) hypothesis is valid if and only if there exist superconductivity knots in dimensions 4 through 11. The reason is that Christian local realism implies that the 7 extra superstring dimensions represent local measurement in some forms of superconductivity. On the other hand, Seiberg-Witten M-theory implies that the 7 extra superstring dimensions represent quantum uncertainty and quantum non-locality. Does local realism imply that the 11-dimensions of the M-theoretical fundamental domain should show up experimentally? What precisely is meant by local realism? What might be meant by "disproof of Bell's theorem"?

When Christian claims that he has "disproved Bell's theorem" he means he has disproved Christian's idiosyncratic formulation of Bell's theorem (WHICH HE DENIES IS IDIOSYNCRATIC) based upon Christian's concept of what a quantum state really is.

Why does J. Christian use his idiosyncratic definitions? Christian bases all his analysis on the EPR paper and Bell's first two papers. Christian's version of Bell's theorem stems from a rigorous intellectual pursuit of Bell's definitions. Christian claims that he uses Bell's original definitions of "local" and "realistic" and that there is a mathematical mistake in the first line of Bell's proof of Bell's theorem.

http://www.drchinese.com/David/Bell_Compact.pdf "On the Einstein Podolsky Rosen Paradox" by John Bell, 1964

Joy Christian has a PhD with Abner Shimony as thesis advisor.

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

Why is the M-theoretical fundamental domain 11-dimensional? There might be 4 dimensions of spacetime and 7 dimensions of topological measurement. The 7 dimensions of topological measurement somehow come from Christian's parallelized 7-sphere model. What good is all that, you might ask? The 7-dimensions of topological measurement allow the simulation of linear momentum, angular momentum, and quantum spin by a deterministic flow of information through Christian's model. How is that Bell's theorem is not violated? Well, Bell's theorem IS VIOLATED! Christian convincingly demonstrates that Bell's alleged theorem is false as a physical theorem (although it might be true as a mathematical theorem assuming that the Copenhagen interpretation is 100% correct.) Where did Bell go wrong? Bell used quantum SU(1) states whereas Christian correctly uses quantum SU(8) states. Christian got his PhD with THE-BELL-THEOREM-EXPERT Abner Shimony as thesis advisor, and Christian really knows his stuff — Christian is very meticulous. Most of Christian's papers can be found on arxiv.org .

http://arxiv.org/find/all/1/au:+Christian_Joy/0/1/0/all/0/1

Note that if Christian is correct, then SU(8) should be the fundamental gauge group for our universe.

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

BROWN'S M-THEORY HYPOTHESIS: There are 3 and only 3 plausible physical interpretations of M-theory: (1) Seiberg-Witten compactification; (2) Christian parallelized 7-sphere model as final word; and (3) Fredkin-Wolfram-Brown automaton feeding into the parallelized 7-sphere model. Both (2) and (3) imply that 11-dimensional knot theory can be fully realized in tests of D-wave superconductivity. This incredible, decisive test should once and for all decide if NKS Chapter 9 is true or false.

Is the preceding hypothesis complete rubbish?

Scott Aaronson of M.I.T. and Joy Christian of Oxford have been in a dispute which can be found on Aaronson's blog "Shtetl-Optimized".

http://scottaaronson.com/blog/?p=993 "Bell's-Inequality-Denialist Joy Christian …"

Is J. Christian's work mathematically sound?

I received an e-mail from Thomas H. Ray (May 13, 2012) in a reply to a question as to whether he understood the theory of teleparallel gravity. His answer was in part, "I'm not a PhD. I'm also not a physicist, so I am not familiar with many of the more esoteric theories. I do know the mathematics of classical mechanics and relativity quite well, however, ...

I got involved a little over a year ago, because when I became aware (on FQXi) that someone claimed to "disprove" a mathematical theorem, I was compelled to point out that one can't do that and still use mathematics to describe the physical world. In the process, however, I read all the criticism of Joy's framework, most of which revolved around a claim of an error that amounts to " + 1 = - 1." I recognized early on that there is no such error, that the analytical model obviates such an error.

Aside from Joy himself and Fred Diether, I haven't been in close contact with others who might have actually studied Joy's research -- and I have begun to get the impression that that is a very small set, anyway.

My role is that of waging an honest defense of Joy's mathematical framework, which I find to be self consistent. I know it's a quixotic quest, for there isn't a mathematician in the world who will admit the idea of "disproof" (including me)."

I think that Thomas H. Ray is correct about the mathematics employed by Christian. J. Christian does NOT claim to have refuted "Bell's Theorem within the paradigm of the Copenhagen Interpretation" — he claims to have used "Bell's definitions" as presented in Bell's first 2 papers and to have identified Bell's so-called mistake. Scott Aaronson, T. H. Ray, and D. Brown agree that one does not "disprove a theorem", one does not "disprove an axiom", and one does not "disprove a rule of inference." What has J. Christian really accomplished?

BROWN'S IDEA OF Aaronson's Version of Bell's Theorem: No physical theory of local hidden variables based upon quantum Bell states can reproduce all of the predictions of quantum theory in the sense of the Copenhagen interpretation.

BROWN'S IDEA OF Christian's Formulation of Bell's Theorem: No physical theory of local hidden variables based upon quantum Christian SU(8) states can reproduce all of the predictions of quantum theory in the sense of the Christian interpretation of quantum theory. The Christian interpretation means the extension of the Copenhagen interpretation based upon Christian's theory of local realism.

So what, you might ask? Christian claims to have given a theoretical disproof of Bell's alleged theorem.

In a discussion with Joy Christian, Scott Aaronson wrote, "... your experimental prediction is that the Bell/CHSH inequality can still be violated, even in a certain 'macroscopic' experiment where physicists would say that there's nothing quantum mechanical going on." Christian and his supporters are far more radical than that. They claim that the Copenhagen interpretation is only approximately true. They perhaps do not use language quite as precisely as Scott Aaronson does. On page 11 of Christian's "On the Origins of Quantum Correlations", he uses the term "classical correlations" when I think that he should use the term "M-theoretical local realistic correlations". When Christian says he has "disproved Bell's theorem" he means he has used Bell's physical assumptions with Christian's HYPOTHESES about general quantum states to refute Bell's theorem AS A THEOREM IN PHYSICS (not necessarily as a theorem in mathematics given the assumption that the Copenhagen interpretation is true).

Christian introduces a 7-sphere in a way new to physics. Critics might say that the introduction of the 7-sphere is nonlocal realism involving quantum uncertainty spread across the universe, but Christian, Thomas H. Ray, and others say that the introduction of the 7-sphere is local realism. Consider the following exchange between David Brown and Thomas Howard Ray:

BROWN: The mathematical definitions made by Bell are PART OF THE DEFINITIONS of "quantum correlation" and "local realism".

RAY: Then they are merely metaphysical claims, aren't they?

BROWN: These definitions are used by those do experiments concerning quantum entanglement.

RAY: Which is why they can assign the value of nonlocality to experiments not done, and call it a day. Fatal error — assuming what one wants to prove, and proving it by induction alone.

And look, I'm not saying these assumptions are not useful. They do not, however, come up to the level of comprising a complete physical theory.

*** Does Ray make some good points? Is quantum incompleteness really a flaw in the Copenhagen interpretation? What is local realism? Christian claims, "My model is realistic precisely in the sense of EPR and precisely in the sense specified by Bell." Christian claims that careful study of the original EPR paper and Bell's first two papers will convince an unbiased, objective theoretical physicist of his claims about local realism.

On p. 12 of "On the Origins of Quantum Correlations", we find:

Christian's Theorema Egregium: "Every quantum mechanical correlation can be understood as a classical, local-realistic correlation among a set of points of a parallelized 7-sphere …"

Is the phrase "quantum mechanical correlation" debatable in terms of its appropriateness? Is the term "classical" misleading or actually wrong? Should the word "classical" be replaced by the phrase "EPR mechanical"?

Semantically Neutral Version of Christian's Theorema Egregium: Every quantum mechanical Christian SU(8) correlation can be understood as a realistic Christian SU(8) correlation among a set of points of a parallelized 7-sphere.

Is the semantically neutral version better for purposes of debate?

http://arxiv.org/pdf/1201.0775v4.pdf "On the Origins of Quantum Correlations"

On p. 19 of "On the Origins of Quantum Correlations", Christian suggests that Bell's theory of quantum correlations is wrong and that, "Instead we have demonstrated how a perfectly natural explanation of the observed correlations is possible. In our view these correlations are the evidence, not of non-locality, but of the fact that the physical space we live in respects the symmetries and topologies of a parallelized 7-sphere. … The 3-dimensional space we normally inhabit is then simply one of the many fibers of the 7-sphere."

When asked about the physical nature of the 3-sphere in his construction, Christian replied (Aaronson blog posting), "I am indeed saying that the spatial slice of our universe is a 3-sphere, but this 3-sphere is NOT the one that is usually assumed in a closed FRW spacetime. This difference is in its topology. The 3-sphere I am talking about is parallelized. It is the one that appears in teleparallel gravity. Its Riemannian tensor is zero, but torsion non-zero (and constant)."

http://en.wikipedia.org/wiki/Friedmann–Lemaître–Robertson–Walker_metric

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

Christian's Theorema Egregium might satisfactorily define the smoothing of the Nambu transfer machine with the infinite nature hypothesis; the Nambu transfer machine is a hypothetical part of Wolfram's automaton explaining dark matter, dark energy, and the space roar with the finite nature hypothesis.

http://vixra.org/pdf/1202.0092v1.pdf "Finite Nature Hypothesis and Space Roar Profile Prediction"

Is Fredkin's Finite Nature Hypothesis empirically invalid? If nature is infinite then does the smoothing of the Nambu transfer machine have a meaning roughly equivalent to Christian's theory of local realism? Is there overwhelming empirical evidence in favor of the Rañada-Milgrom effect?

Joy Christian wrote, "... I demonstrated, convincing to me, that scalable quantum computing is impossible in the physical world." I would say that Christian means that ALL SO-CALLED QUANTUM PHENOMENA, quantum tunneling, quantum wave/particle duality, superconductivity, etc. are examples of Christian's theory of local realism and NOT the quantum theory. He means that, to his satisfaction, he has mathematically demonstrated GIVEN HIS ASSUMPTIONS ABOUT QUANTUM SU(8) STATES that quantum non-locality is false and EPR local realism is true. I would say that Christian has mathematically established the basis for M-theory and that the Copenhagen interpretation is almost always, but not quite, 100% correct. Bell's theorem is indeed 100% true within the paradigm of the Copenhagen interpretation, but when the Copenhagen interpretation fails then so does Bell's theorem. I claim that the empirical validity of the Rañada-Milgrom effect strongly suggests that CHRISTIAN IS CORRECT, UNBELIEVABLE AS IT MIGHT SEEM. I think that Scott Aaronson, Richard Gill, and Florin Moldoveanu have totally failed to understand Christian's mathematical argument, which is logically sound. The problem is with the physical significance of the introduction of the parallelized 7-sphere. Thomas H. Ray, Edward Eugene Klingman, and Fred Diether are at least minimally competent mathematicians. All three of them say that Christian's argument is mathematically valid. What does this have to do with M-theory? Seiberg-Witten M-theory is perhaps wrong because it implies that the Rañada-Milgrom effect is only approximately true. If modified M-theory with Wolfram's mobile automaton is the way nature works, then Christian's parallelized 7-sphere model is the smoothing of the Nambu transfer machine. If M-theory is empirically valid, and nature is infinite, then Christian's theory of local realism is valid without Wolfram's "A New Kind of Science" Chapter 9. Have M-theorists unjustifiably ignored the work of Fernández-Rañada and Milgrom? The Rañada-Milgrom effect states 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 sqrt((60±10)/4) * 10^-5 based upon the Pioneer anomaly data.

http://vixra.org/pdf/1202.0083v1.pdf "Anomalous Gravitational Acceleration and the OPERA Neutrino Anomaly"

http://vixra.org/pdf/1203.0034v1.pdf "Does the Rañada-Milgrom Effect Explain the Ecliptic Alignment of CMB Anisotropy?"

http://vixra.org/pdf/1203.0036v1.pdf "Does the Rañada-Milgrom Effect Explain the Flyby Anomaly?"

http://vixra.org/pdf/1204.0095v1.pdf "Seiberg-Witten M-theory as an Almost Successful Predictive Theory"

Because M-theory is the only plausible hope for explaining the Rañada-Milgrom effect, it seems as if Christian might be basically correct about the fundamental nature of quantum phenomena. Therefore, because there is overwhelming empirical evidence in favor of the Rañada-Milgrom effect, there is a suggestion that Christian's parallelized 7-sphere model is empirically valid.

Why does the Rañada-Milgrom effect give support to Christian's parallelized 7-sphere model? Here is my reasoning in 4 hypotheses:

(1) According to the work of Milgrom, McGaugh, and Kroupa, there is overwhelming evidence in favor of Milgrom's acceleration law for galactic rotation curves.

(2) An easy scaling argument shows that the Rañada-Milgrom effect is approximately equivalent to Milgrom's acceleration law.

(3) M-theory is, in Steven Weinberg's words, the only game in town so that some form of M-theory is needed to explain the Rañada-Milgrom effect.

(4) Christian's deterministic model is THE ONLY WAY to get a form of M-theory that does not suffer from runaway Markov branching, i.e., an unsatisfactory string landscape that is difficult to analyze.

What do (1) through (4) imply?