

Does Information Below the Planck Scale Explain the Space Roar?

ABSTRACT

If quantum information is reducible to more fundamental deterministic information, then the reduction should explain new physics. The space roar might be a clue to new physics.

INTRODUCTION

Does quantum information arise from a deeper level of information below the Planck scale? Does the space roar have an explanation within conventional quantum field theory and general relativity theory? What is the space roar?

THE SPACE ROAR AND POSSIBLE EXPLANATIONS

A mysterious phenomenon called the “space roar” consists of a radio static of unknown origin, seemingly pervasive throughout our universe. According to science writer Dennis Overbye, “... Alan Kogut, of the Goddard Space Flight Center, ... led a team that discovered the signal accidentally while scanning the skies in July 2006 with a set of sensitive radio receivers called Arcade lofted 21 miles high on a balloon. The signal manifests itself as a puzzling excess at certain frequencies of a fog of microwaves that permeates the cosmos and is probably left over from the Big Bang itself. It suggests that something is pumping large amounts of extra energy — about six times more than can be accounted for by all the galaxies known and unknown — into the universe.”[1]

Can superstring theory explain the space roar? In a paper on superstring determinism, ‘t Hooft wrote, “... 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 zeroes, can be mapped onto a fermionic quantum field in a similar way. The natural system to apply all of this to is superstring theory ...”.[2]

If a finite cellular automaton can successfully model superstring theory, then the multiverse might be a finite automaton satisfying several properties:

Property 1: Quantum field theory and general relativity theory arise from a superstring lattice approximation.

Property 2: The equivalence principle is 100% true for mass-energy that is implicitly or explicitly measured in some particular universe of the multiverse, but the equivalence principle is 100% false for mass-energy that is neither implicitly nor explicitly measured but remains spread throughout the multiverse.

Property 3: For each universe in the multiverse, the maximum physical wavelength is the Planck length times the Fredkin-Wolfram constant.

Property 4: In each universe of the multiverse, the percentage of dark energy remains constant, but ordinary mass-energy is converted into dark matter at a constant rate until

the universe reaches its maximum physical wavelength and undergoes an instantaneous quantum collapse.

Could Properties 1 through 4 somehow explain the space roar?[3],[4],[5],[6],[7]

Let us suppose that Properties 1 through 4 are false. How can nondeterministic string theory explain the space roar? If string theory is a valid empirical theory, then what are the explanations for dark energy and dark matter? Is it possible that dark energy is D-brane noise and that dark matter is D-brane reinforcement of the gravitational signal? Does the explanation of dark energy consist merely of a nonzero cosmological constant that has its range predicted by the anthropic principle? Are there dark matter particles that explain dark matter in terms of string theory?

Edward Witten claims, "We have one real candidate for changing the rules; this is string theory." [8] According to Witten, "The requirements of quantum mechanics plus special relativity are so tight that historically constructing string theories was very difficult." [9] In Witten's opinion, "Perhaps the most basic thing we have learned about string theory is that it modifies the concepts of space-time that Einstein developed." [10] Why should we believe that string theory is the way to new physics? According to Witten, "String theory forces general relativity upon us, whereas standard quantum field theory apparently makes it impossible to incorporate general relativity." [11] Something unknown happened in the early universe to cause the space roar, and string theory might be the key to understanding this mystery. Information below the Planck scale might somehow solve the mystery of string theory.

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