

Letter to a Friend of Mine: - Yes, God Plays Dices.

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Abstract-In the present letter the time evolution of the universe is compared with the growth of a polymer chain. It is proposed a link between the Evolving Block Universe, a model by Ellis and Rothman, with the Self Avoiding Random Walk Model. An old popular song: “Que Sera, Sera”, nicely fits to the model’s unpredictability.

Dear friend and colleague Nilton,

Recently I discovered the paper: " Time and Spacetime: “The Crystallizing Block Universe” (CBU), from the authors: George FR Ellis and Tony Rothman , Reference: arXiv : 0912.0808v1[quant - ph], 4 Dec 2009. In it, the authors explain that the future shows all the signs of quantum weirdness, including duality, uncertainty and entanglement. With the passage of time after completion of the reduction process of the state vector, the past emerges, with the previously existing quantum uncertainty, being replaced by certain classical states and particles of defined identities. The authors discuss two models: the first called Evolving Block Universe (EBU) and the second the CBU that gives title to the paper, the latter with a description that seems to be more realistic or more enhanced. What is interesting it is found particularly in the EBU model, the motion of "world line" of a particle is controlled in a random manner (Fig. 1 in the article). The reason is: I had published a paper entitled: "Cosmological constant and polymer physics", ref: arXiv:0812.4007v1[gr-qc]. In it I had proposed that the temporal evolution of the universe could be compared to the growth of a polymer chain. In polymers, monomers suspended in a dilute solution will be added to the body of the polymer chain, where the free end can have varied angles at which the next monomer can be fixed. However, once fixed at a certain angle, other monomers can no longer be fixed at that point (is the problem of the excluded volume or "Self - Avoiding Random Walk"). This seems analogous to the case of future possibilities EBU model with the already polymerized part of the string representing the past.

I have found in the WEB, a simulation of a Self-avoiding random walk on the cubic lattice [link 1], and on the square lattice [link2], both posted by Nathan Clisby on the youtube. Besides this, the history of the popular song: “Que Sera,

Sera”, by Jay Livingston and Ray Evans, is reported in Wikipedia [link 3]. As can be verified in [link 4], The beautiful song: “Que Sera, Sera (Whatever Will Be, Will Be)”, is nicely interpreted by Doris Day with Children’s Chorus, posted in youtube by Michael McKenna.

I think that this song nicely fits to the EBC-polymer chain growth models of universe unpredictability.

A joke comes to the mind: - says the popular’ saying: - The future belongs to God. According to the EBU, the future is a set of possibilities (probabilities), governed by the laws of quantum mechanics! A conclusion: - Yes, God plays dices!

LINKS

[link 1] <https://www.youtube.com/watch?v=GHzfadEuk1U>

[link 2] <https://www.youtube.com/watch?v=WPUH8Rs-oig>

[link 3]

http://en.wikipedia.org/wiki/Que_Sera,_Sera_%28Whatever_Will_Be,_Will_Be%29

[link4] www.youtube.com/watch?v=azxoVRTwINg

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