DOWNLOAD PDF GOD DOES PLAY DICE WITH THE UNIVERSE

Chapter 1 : www.nxgvision.com: Customer reviews: God Does Play Dice with the Universe

One of Albert Einstein's most famous quotes is, "God does not play dice with the universe." But there are two huge errors in the way many people have interpreted this quote over the years. People.

A metaphysical attempt to answer. The universe and its every forming being, the insignificant, the indispensable and the ones in between, are governed by a law. A law that is characterized by everything earthly unlawful: All these randomness got together to form an unifying force that decides the laws governing the universe and the fate of the earthlings. This inexplicable unified law became, in the hearts of the people who cannot perceive the imperceptible, God. The extremely chaotic nature of this unified law or God has been perplexing the logical minds until today. Is it everything about randomness? Is there no coherent intention behind all this creation? To our dismay, the answer is no! It is purely random. This would have been a much more meaningful life if there is a greater degree of certainty and order. May it be the laws governing the universe. Or the very nature of a tellurian. There is no much difference between how the universe functions and how a human mind thinks. Equally the human mind is as chaotic as the heaven. Is there an order within ourself? Why do we seek consistency of thoughts or actions in the creator while we remain haphazardly tumultuous in our very fabric? We seek for a purpose while we are lost in a convoluted labyrinth built by our desires for the unknown. In our pursuit for life and happiness thereafter, we have built our thought structures extremely complicated. Not the one same as the other. So do choices and aversion. Some of our thoughts are made rationally and some others are intuition. Many remain under the unknown category. Our behavior, not just collective but the individual ones too, have no stipulated directions. Your brain might feel melancholic while it rejoices. It could be exuberating invisible joy while it mourns. When you think, your nerve cells fire and exchange information through glia. Millions of such exchanges happen in your body without your directive. You control your five senses yet you act reflex when there is a need. Dive deeper into human cognitive process and certainly it gets as or even more complex than the laws governing the universe. There is a lot of unknown territory within your conscience as vast as the unexplored regions in the cosmos. Both the universe and the human mind are astonishingly mysterious and unfathomable. Both are deep, vast, profound yet subtle. There is no one, singular condition or law that governs them. But, they are both governed by a probability of many factors that remain far from our comprehension. The subatomic particles that make up everything around us act weird and the reason for their eccentricity is still unknown. This is quantum physics. Both point towards randomness. Sir Albert Einstein,undoubtedly the greatest mind of the century. The law that runs the universe or the god is not a craftsman who abandoned her creation. If we should question her forthrightness, we should first justify our integrity. Our free will has gone astray. It has unchastened our purpose. Our very true nature explains that God does play a dice. Also, it still rolls.

Chapter 2 : Quote by Albert Einstein: â€œGod does not play dice with the universe.â€•

So God does play dice with the universe. All the evidence points to him being an inveterate gambler, who throws the dice on every possible occasion. Other scientists were much more ready than Einstein to modify the classical 19th century view of determinism.

Comment God Does Play Dice. A Startling New Picture of the World. Einstein Could Not Believe. But You Can Understand. Subject to statutory exception and to provisions of relevant collective licensing agreements, no part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, without the prior written permission of the author. The sands of time The immobile picture of motion Seeing is Believing? Question of continuous motion The mysterious double slit What does modern science say? The Cause of Motion Force induces motion? Notes Bibliography Index vi 90 95 95 99 Illustrations Figure 1. I have also benefited from discussions with many physicists who care about the way the world really is. I thank them all deeply. This book could not have been completed without their care and support. Finally, I am grateful to my lovely daughter RuiQi. They let me constantly rethink the accepted picture of the world. She is very like I was during childhood! Yet, there is a ghostlike atomic world underneath. Everyone knows that a ball is composed of atoms. But nobody knows what atoms look like, and especially, how in hell atoms move. It appears to move in a continuous way. This, however, is a mere illusion. Even the greatest scientists Newton and Einstein were also deluded by the appearance. How on earth do objects move then? This book will reveal a deep secret of nature for the first time. It is that everything in the universe, whether it is an atom or a ball or even a star, ceaselessly jumps in a random and discontinuous way. In a famous metaphor, God does play dice with the universe. This picture of reality is so strange that nobody even dreamed of it. But it is real. Discovering that motion is not continuous but discontinuous and random is like finding the Earth is not at rest but moving. It will lead to a profound shift in our world view. Reality is really amazing! I had a strong desire to know the whys and wherefores. Later I found the answer in textbooks. It changed my picture of the universe. When I was an undergraduate, I was entranced by the deep mysteries of the atomic world. I was especially stunned by the fact that the commonsensible planetary picture of atoms turns out to be utterly false; the electron in an atom cannot rotate round the atomic nucleus as the Earth rotates round the sun, or else it would soon radiate its energy and fall into the nucleus, and as a result, my body composed of atoms would collapse in a blink. How does the electron move then? It must exist in the atom. It must move in some way there. But more surprisingly, textbooks provided no picture of the motion of an electron. On 22 August , I wrote in my diary: In order to find how the electron moves in an atom, I went to the Institute of Electronics, Chinese Academy of Sciences to pursue my graduate study. But it was according to expectation that nobody there could give me any tips either. I then spent nearly every day in musing the seemingly indescribable motion picture of electrons. If a ball indeed moves in a continuous way, then it seems that an electron or an atom should also move in the same way. But, on the other hand, if an electron moves continuously in an atom, it will soon fall into the nucleus, while the tragedy does not happen in reality. This is a great dilemma. I found some possible solutions, but they shortly proved to be wrong. The puzzle had been plaguing me. Day after day, I gradually doubted the reality of continuous motion. But I still felt in my bones that the particle must move in some way. Finally, in the early morning of 12 October , I experienced a sudden enlightenment. At that moment, I felt that my body permeated the whole space of the universe and I was united with it. A clear picture then appeared: God told me He plays dice in the atomic world. I finally broke loose the tightest shackles of continuous motion with the help of inspiration. I could then see the true face of motion. After the event, this outcome seems very natural from a logical point of view. Since a particle cannot move continuously, it must move in a discontinuous way. How deep-rooted the prejudice of the uniqueness of continuous motion is! If an atom moves in a random and discontinuous way, then it can easily pass through two slits at the same time. But why does a ball appear to move in a contrary way? Moreover, why in hell does God play dice? These puzzles further haunted me. So I decided to be an independent research scientist, or more accurately, a natural philosopher who aims at understanding the mysterious universe. Life was not easy.

But I never gave up my research, and I never stop thinking. It had become the theme of my life. Curiosity then turned to responsibility. I must let all people see the light of truth. As time went on, the picture of random discontinuous motion became clearer and clearer in my mind. When I took a walk one afternoon in June , I suddenly had another inspiration after long reflection in solitude and meditation. I realized that motion has no cause in reality, and thus it must essentially be random, i. Moreover, the familiar inertial motion of a ball has actually revealed that it also jumps in a random and discontinuous way just like an atom. This is a great revelation. Maybe the path to truth is always devious in order that surprise can hide at the turn waiting for persevering seekers. God also plays dice in our classical world. He actually plays dice with the whole universe. What a harmonic picture of the world! I simply think on it continually. But the exploration has completely changed my life. It shapes the way of my life, and finally leads me to God, the ultimate reality. But in order to explain it in plain language, it becomes a little complex so that a mini-book is needed. There is only a clear and amazing picture of the universe here. It is comprehensible to everyone. Especially, no knowledge of quantum physics is needed. In fact, the book will lead you from our familiar classical world to the weird atomic world along a logical road. You can then understand the enigmatic quantum more deeply than its discoverers. The ultimate truth will be simple and apprehensible. Everybody is a mere mote in the universe. Yet God gives us mind; thus we can know and understand His thoughts. The most happiness is not beyond this. He will require to grow accustomed to the sight of the upper world. And first he will see the shadows best, next the reflections of men and other objects in the water, and then the objects themselves; then he will gaze upon the light of the moon and the stars and the spangled heaven Last of he will be able to see the sun. The study of motion begins with an old and famous arrow. Its owner was the Greek philosopher Zeno of Elea, who lived about years ago. The flying arrow cannot be moving Zeno was the first man who seriously pondered over the puzzle of motion. He conceived many paradoxes of motion, the most famous being that of the arrow. But was he right?

Chapter 3 : Atheism: Common Arguments

From a quotation of Albert Einstein, "I, at any rate, am convinced that [God] does not throw dice" [Jedenfalls bin ich Ã¼berzeugt, daÃŸ der nicht wÃ¼rfelt.], [1] by which he expressed his dissatisfaction with the preeminence of probability in the Copenhagen interpretation of quantum mechanics.

Stephen Hawking Does God play Dice? This lecture is the intellectual property of Professor S. You may not reproduce, edit, translate, distribute, publish or host this document in any way with out the permission of Professor Hawking. This is to allow correct pronunciation and timing by a speech synthesiser. This lecture is about whether we can predict the future, or whether it is arbitrary and random. In ancient times, the world must have seemed pretty arbitrary. Disasters such as floods or diseases must have seemed to happen without warning, or apparent reason. Primitive people attributed such natural phenomena, to a pantheon of gods and goddesses, who behaved in a capricious and whimsical way. There was no way to predict what they would do, and the only hope was to win favour by gifts or actions. Many people still partially subscribe to this belief, and try to make a pact with fortune. They offer to do certain things, if only they can get an A-grade for a course, or pass their driving test. Gradually however, people must have noticed certain regularities in the behaviour of nature. These regularities were most obvious, in the motion of the heavenly bodies across the sky. So astronomy was the first science to be developed. It was put on a firm mathematical basis by Newton, more than years ago, and we still use his theory of gravity to predict the motion of almost all celestial bodies. Following the example of astronomy, it was found that other natural phenomena also obeyed definite scientific laws. This led to the idea of scientific determinism, which seems first to have been publicly expressed by the French scientist, Laplace. They are in French of course, not that I expect that would be any problem with this audience. But the trouble is, Laplace was rather like Prewst, in that he wrote sentences of inordinate length and complexity. So I have decided to para-phrase the quotation. In effect what he said was, that if at one time, we knew the positions and speeds of all the particles in the universe, then we could calculate their behaviour at any other time, in the past or future. That must be the position of every scientist. A scientific law, is not a scientific law, if it only holds when some supernatural being, decides to let things run, and not intervene. It implies that we can predict the future, in principle at least. In practice, however, our ability to predict the future is severely limited by the complexity of the equations, and the fact that they often have a property called chaos. As those who have seen Jurassic Park will know, this means a tiny disturbance in one place, can cause a major change in another. A butterfly flapping its wings can cause rain in Central Park, New York. The trouble is, it is not repeatable. The next time the butterfly flaps its wings, a host of other things will be different, which will also influence the weather. That is why weather forecasts are so unreliable. Despite these practical difficulties, scientific determinism, remained the official dogma throughout the 19th century. The first of these developments was what is called, quantum mechanics. This was first put forward in , by the German physicist, Max Planck, as an ad hoc hypothesis, to solve an outstanding paradox. According to the classical 19th century ideas, dating back to Laplace, a hot body, like a piece of red hot metal, should give off radiation. It would lose energy in radio waves, infra red, visible light, ultra violet, x-rays, and gamma rays, all at the same rate. However, Planck showed one could avoid this disaster, if one gave up the idea that the amount of radiation could have just any value, and said instead that radiation came only in packets or quanta of a certain size. The energy in the packets or quanta, is higher for ultra violet and x-rays, than for infra red or visible light. This means that unless a body is very hot, like the Sun, it will not have enough energy, to give off even a single quantum of ultra violet or x-rays. Planck regarded the idea of quanta, as just a mathematical trick, and not as having any physical reality, whatever that might mean. However, physicists began to find other behaviour, that could be explained only in terms of quantities having discrete, or quantised values, rather than continuously variable ones. For example, it was found that elementary particles behaved rather like little tops, spinning about an axis. It had to be some multiple of a basic unit. Because this unit is very small, one does not notice that a normal top really slows down in a rapid sequence of discrete steps, rather than as a continuous process. But for tops as small as atoms, the discrete nature of spin is very important. It was some time before

people realised the implications of this quantum behaviour for determinism. To see where a particle is, one has to shine light on it. One has to use at least one quantum. To measure the position of the particle accurately, you will have to use light of short wave length, like ultra violet, x-rays, or gamma rays. So they will disturb the speed of the particle more. It is a no win situation: How could one predict the future, when one could not measure accurately both the positions, and the speeds, of particles at the present time? No matter how powerful a computer you have, if you put lousy data in, you will get lousy predictions out. Einstein was very unhappy about this apparent randomness in nature. He seemed to have felt that the uncertainty was only provisional: This reality might be known to God, but the quantum nature of light would prevent us seeing it, except through a glass darkly. Hidden variable theories might seem to be the most obvious way to incorporate the Uncertainty Principle into physics. They form the basis of the mental picture of the universe, held by many scientists, and almost all philosophers of science. But these hidden variable theories are wrong. The British physicist, John Bell, who died recently, devised an experimental test that would distinguish hidden variable theories. When the experiment was carried out carefully, the results were inconsistent with hidden variables. Thus it seems that even God is bound by the Uncertainty Principle, and can not know both the position, and the speed, of a particle. So God does play dice with the universe. All the evidence points to him being an inveterate gambler, who throws the dice on every possible occasion. Other scientists were much more ready than Einstein to modify the classical 19th century view of determinism. A new theory, called quantum mechanics, was put forward by Heisenberg, the Austrian, Erwin Schroedinger, and the British physicist, Paul Dirac. Dirac was my predecessor but one, as the Lucasian Professor in Cambridge. Although quantum mechanics has been around for nearly 70 years, it is still not generally understood or appreciated, even by those that use it to do calculations. Yet it should concern us all, because it is a completely different picture of the physical universe, and of reality itself. Instead, they are represented by what is called a wave function. This is a number at each point of space. The size of the wave function gives the probability that the particle will be found in that position. The rate, at which the wave function varies from point to point, gives the speed of the particle. One can have a wave function that is very strongly peaked in a small region. This will mean that the uncertainty in the position is small. But the wave function will vary very rapidly near the peak, up on one side, and down on the other. Thus the uncertainty in the speed will be large. Similarly, one can have wave functions where the uncertainty in the speed is small, but the uncertainty in the position is large. The wave function contains all that one can know of the particle, both its position, and its speed. If you know the wave function at one time, then its values at other times are determined by what is called the Schroedinger equation. Thus one still has a kind of determinism, but it is not the sort that Laplace envisaged. Instead of being able to predict the positions and speeds of particles, all we can predict is the wave function. This means that we can predict just half what we could, according to the classical 19th century view. Although quantum mechanics leads to uncertainty, when we try to predict both the position and the speed, it still allows us to predict, with certainty, one combination of position and speed. However, even this degree of certainty, seems to be threatened by more recent developments. Interestingly enough, Laplace himself wrote a paper in on how some stars could have a gravitational field so strong that light could not escape, but would be dragged back onto the star. He even calculated that a star of the same density as the Sun, but two hundred and fifty times the size, would have this property. But although Laplace may not have realised it, the same idea had been put forward 16 years earlier by a Cambridge man, John Mitchell, in a paper in the Philosophical Transactions of the Royal Society. Both Mitchell and Laplace thought of light as consisting of particles, rather like cannon balls, that could be slowed down by gravity, and made to fall back on the star. But a famous experiment, carried out by two Americans, Michelson and Morley in , showed that light always travelled at a speed of one hundred and eighty six thousand miles a second, no matter where it came from. How then could gravity slow down light, and make it fall back. Does God Play Dice? This was impossible, according to the then accepted ideas of space and time. But in , Einstein put forward his revolutionary General Theory of Relativity. In this, space and time were no longer separate and independent entities. Instead, they were just different directions in a single object called space-time. This space-time was not flat, but was warped and curved by the matter and energy in it. In order to understand this, considered a sheet of rubber, with a weight placed on it, to represent a star. The

weight will form a depression in the rubber, and will cause the sheet near the star to be curved, rather than flat. If one now rolls marbles on the rubber sheet, their paths will be curved, rather than being straight lines.

Chapter 4 : "God does not play dice with the universe"? | Yahoo Answers

God Does Play Dice With the Universe is a great book for anyone interested in the quantum theory and its implications. Its only pages and double spaced, so can be easily read in one or two nights.

As he said himself: Therefore, let every man be active, each in his own denomination if you please, and let every man take it as his first and most sacred duty to oppose anyone who in his activity by word or deed steps outside the confines of his religious community and tries to butt into the other. Still a member in good standing of the Church of Rome despite detestation of its hierarchy "I am now as before a Catholic and will always remain so" [quoting Hitler] , he carried within him its teaching that the Jew was the killer of God. The extermination, therefore, could be done without a twinge of conscience since he was merely acting as the avenging hand of God--so long as it was done impersonally, without cruelty. Hitler was speaking in private, not before a mass audience, and so it is difficult to dismiss the comment as propaganda lies. Of course, someone bad believing something does not make that belief wrong. The Bible proves it "In the Bible it says that Thus, any claimed "truth" in it is of questionable legitimacy. Many atheists also feel that because any passage is subject to "interpretation," any claim that a passage "means" one thing and one thing only is not legitimate. Note that this feeling tends to extend to other books. It is also remarkable to many atheists that theists tend to ignore other equally plausible religious books in favor of those of their own religion. Therefore it is foolish to be an atheist. It has several flaws. Firstly, it does not indicate which religion to follow. Indeed, there are many mutually exclusive and contradictory religions out there. This is often described as the "avoiding the wrong hell" problem. Which should we believe in? If we believe in all of them, how will we decide which commandments to follow? Secondly, the statement that "If you believe in God and turn out to be incorrect, you have lost nothing" is not true. Consider also the deaths that have resulted from people rejecting medicine in favor of prayer. Another flaw in the argument is that it is based on the assumption that the two possibilities are equally likely--or at least, that they are of comparable likelihood. If, in fact, the possibility of there being a God is close to zero, the argument becomes much less persuasive. So sadly the argument is only likely to convince those who believe already. Also, many feel that for intellectually honest people, belief is based on evidence, with some amount of intuition. It is not a matter of will or cost-benefit analysis. Formally speaking, the argument consists of four statements: One does not know whether God exists. Believing in God is of no consequence if God does not exist. There are two approaches to the argument. The first is to view Statement 1 as an assumption, and Statement 2 as a consequence of it. The alternative approach is to claim that Statements 1 and 2 are both assumptions. The problem with this is that Statement 2 is then basically an assumption which states the Christian position, and only a Christian will agree with that assumption. The argument thus collapses to "If you are a Christian, it is in your interests to believe in God"--a rather vacuous tautology, and not the way Pascal intended the argument to be viewed. If God is omniscient, he will certainly know who really believes and who believes as a wager. He will spurn the latter In addition, this hypothetical God may require more than simple belief; almost all Christians believe that the Christian God requires an element of trust and obedience from his followers. That destroys the assertion that if you believe but are wrong, you lose nothing. Finally, if this God is a fair and just God, surely he will judge people on their actions in life, not on whether they happen to believe in him. A God who sends good and kind people to hell is not one most atheists would be prepared to consider worshipping. If he did, he called himself Lord. This means that either: He was Lord, He was a liar, or He was a lunatic. So surely we must conclude that he was Lord? This is at least debatable. Secondly, the argument attempts a logical fallacy which we might call "trifurcation," by analogy with "bifurcation" see the " Constructing a Logical Argument " document. That is, the argument attempts to restrict us to three possibilities, when in fact there are many more. Two of the more likely alternatives are: He was misquoted in the Bible, and did not claim to be Lord. The stories about him were made up, or embroidered with fictitious material by the early Christians. Finally, note that the possibility that he was a "lunatic" is not easily discountable. Even today in the western world there are numerous people who have managed to convince hundreds or thousands of followers that they are the Lord or his One True Prophet.

In more superstitious countries, there are literally hundreds of present-day messiahs. Lewis, the well known author and committed Christian. He wrote many books containing Christian apologia, and also a number of fantasy and SF novels influenced by Christian themes. His most famous books, the Narnia series of novels, are a fantasy retelling of many aspects of Christian faith, with Aslan taking the place of Jesus. In its original form, it said "Do not multiply entities unnecessarily. There is an incredibly intricate and complex universe out there, which came into being as a result of natural processes. There is an incredibly intricate and complex universe out there, and there is also a God who created the universe. Clearly this God must be of non-zero complexity. Unfortunately, some argue that there is a third even more simple solution: We just imagine that there is. This third option leads us logically towards solipsism, which many people find unacceptable. Often theists make their basic claims about God in the form of lengthy analogies or parables. Be aware that atheists have heard of God and know the basic claims; if the sole purpose of your parable is to tell atheists that God exists and brings salvation, you may as well not bother inasmuch as this kind of thing is nothing new. Why I know that God exists "I know from personal experience and prayer that God exists. That evidence varies from person to person. Furthermore, without wishing to dismiss your evidence out of hand, many people have claimed all kinds of unlikely things--that they have been abducted by UFOs, visited by the ghost of Elvis, and so on. Einstein and "God does not play dice" "Albert Einstein believed in God. A better quotation showing what Einstein thought about God is the following: Einstein recognized Quantum Theory as the best scientific model for the physical data available. He did not accept claims that the theory was complete, or that probability and randomness were an essential part of nature. He believed that a better, more complete theory would be found , which would have no need for statistical interpretations or randomness. So far no such better theory has been found, and much evidence suggests that it never will be. In it he says: The more a man is imbued with the ordered regularity of all events the firmer becomes his conviction that there is no room left by the side of this ordered regularity for causes of a different nature. For him neither the rule of human nor the rule of divine will exists as an independent cause of natural events. To be sure, the doctrine of a personal God interfering with natural events could never be refuted [italics his], in the real sense, by science, for this doctrine can always take refuge in those domains in which scientific knowledge has not yet been able to set foot. But I am convinced that such behavior on the part of representatives of religion would not only be unworthy but also fatal. For a doctrine which is to maintain itself not in clear light but only in the dark, will of necessity lose its effect on mankind, with incalculable harm to human progress. In their struggle for the ethical good, teachers of religion must have the stature to give up the doctrine of a personal God, that is, give up that source of fear and hope which in the past placed such vast power in the hands of priests. In their labors they will have to avail themselves of those forces which are capable of cultivating the Good, the True, and the Beautiful in humanity itself. This is, to be sure, a more difficult but an incomparably more worthy task Einstein has also said: It was, of course, a lie what you read about my religious convictions, a lie which is being systematically repeated. I do not believe in a personal God and I have never denied this but have expressed it clearly. If something is in me which can be called religious then it is the unbounded admiration for the structure of the world so far as our science can reveal it. The above quote is from a letter Einstein wrote in English, dated 24 March It is included in Albert Einstein: Also from the same book: I do not believe in immortality of the individual, and I consider ethics to be an exclusively human concern with no superhuman authority behind it. Of course, the fact that Einstein chose not to believe in Christianity does not in itself imply that Christianity is false. Theists care just as much about those things that atheists care about. It is a matter of dispute whether there is any element of design in the universe. Those who believe that the complexity and diversity of living creatures on the earth is evidence of a creator are advised to consult the Talk Origins Archive. There is insufficient space to summarize both sides of that debate here. However, the conclusion is that there is no scientific evidence in favor of so-called Scientific Creationism. Furthermore, there is much evidence, observation and theory that can explain many of the complexities of the universe and life on earth. But if human intelligence is so improbable, surely the existence of a mind capable of fashioning an entire universe complete with conscious beings must be immeasurably more unlikely? The approach used to argue in favor of the existence of a creator can be turned around and applied to the Creationist position.

Chapter 5 : Does God Play Dice? A metaphysical attempt to answer

It requires the wave nature of quantum mechanics to make it possible, proving that Einstein's famous statement, that "God does not play dice with the Universe," was false.

Motivation[edit] Under the Copenhagen interpretation , quantum mechanics is non-deterministic, meaning that it generally does not predict the outcome of any measurement with certainty. Instead, it indicates what the probabilities of the outcomes are, with the indeterminism of observable quantities constrained by the uncertainty principle. The question arises whether there might be some deeper reality hidden beneath quantum mechanics, to be described by a more fundamental theory that can always predict the outcome of each measurement with certainty: In other words, it is conceivable that the standard interpretation of quantum mechanics is an incomplete description of nature. The designation of variables as underlying "hidden" variables depends on the level of physical description so, for example, "if a gas is described in terms of temperature, pressure, and volume, then the velocities of the individual atoms in the gas would be hidden variables" [5]. Others, however, believe that there is no deeper deterministic reality in quantum mechanics. Realistic interpretations which were already incorporated, to an extent, into the physics of Feynman [6] , on the other hand, assume that particles have certain trajectories. Under such view, these trajectories will almost always be continuous, which follows both from the finitude of the perceived speed of light "leaps" should rather be precluded and, more importantly, from the principle of least action, as deduced in quantum physics by Dirac. But continuous movement, in accordance with the mathematical definition , implies deterministic movement for a range of time arguments; [7] and thus realism is, under modern physics, one more reason for seeking at least certain limited determinism and thus a hidden-variable theory especially that such theory exists: Born concluded the paper as follows: Here the whole problem of determinism comes up. From the standpoint of our quantum mechanics there is no quantity which in any individual case causally fixes the consequence of the collision; but also experimentally we have so far no reason to believe that there are some inner properties of the atom which conditions a definite outcome for the collision. Ought we to hope later to discover such properties Or ought we to believe that the agreement of theory and experimentâ€”as to the impossibility of prescribing conditions for a causal evolutionâ€”is a pre-established harmony founded on the nonexistence of such conditions? I myself am inclined to give up determinism in the world of atoms. But that is a philosophical question for which physical arguments alone are not decisive. Quantum mechanics is very worthy of regard. But an inner voice tells me that this is not yet the right track. I, in any case, am convinced that He does not play dice. In his theory, every particle had an associated, hidden "pilot wave" which served to guide its trajectory through space. The theory was subject to criticism at the Congress, particularly by Wolfgang Pauli , which de Broglie did not adequately answer. De Broglie abandoned the theory shortly thereafter. Declaration of completeness of quantum mechanics, and the Bohrâ€”Einstein debates[edit] Main article: Bohrâ€”Einstein debates Also at the Fifth Solvay Congress, Max Born and Werner Heisenberg made a presentation summarizing the recent tremendous theoretical development of quantum mechanics. At the conclusion of the presentation, they declared: He did likewise during the Sixth Solvay Congress held in EPR paradox The debates between Bohr and Einstein essentially concluded in , when Einstein finally expressed what is widely considered his best argument against the completeness of quantum mechanics. Einstein, Podolsky, and Rosen had proposed their definition of a "complete" description as one that uniquely determines the values of all its measurable properties. Einstein later summarized their argument as follows: Consider a mechanical system consisting of two partial systems A and B which interact with each other only during a limited time. Let us now determine the physical state of the partial system A as completely as possible by measurements. This determination, however, gives a result which depends upon which of the physical quantities observables of A have been measured for instance, coordinates or momenta. Since these conditions constitute an inherent element of the description of any phenomenon to which the term "physical reality" can be properly attached, we see that the argumentation of the mentioned authors does not justify their conclusion that quantum-mechanical description is essentially incomplete. He wrote in As a more appropriate way of

expression, one may strongly advocate limitation of the use of the word phenomenon to refer exclusively to observations obtained under specified circumstances, including an account of the whole experiment. If, without in any way disturbing a system, we can predict with certainty i. If, on the other hand, statistical correlations resulting from quantum entanglement could not be explained by local hidden variables, the Bell inequality would be violated. Another no-go theorem concerning hidden-variable theories is the Kochenâ€"Specker theorem. Physicists such as Alain Aspect and Paul Kwiat have performed experiments that have found violations of these inequalities up to standard deviations [18] excellent scientific certainty. This rules out local hidden-variable theories, but does not rule out non-local ones. Theoretically, there could be experimental problems that affect the validity of the experimental findings. The currently best-known hidden-variable theory, the "causal" interpretation of the physicist and philosopher David Bohm , originally published in , is a non-local hidden-variable theory. Bohm unknowingly rediscovered and extended the idea that Louis de Broglie had proposed in and abandoned â€" hence this theory is commonly called "de Broglie-Bohm theory". Bohm posited both the quantum particle, e. Thus, in this theory electrons are quite clearly particlesâ€"when a double-slit experiment is performed, its trajectory goes through one slit rather than the other. Also, the slit passed through is not random but is governed by the hidden guiding wave, resulting in the wave pattern that is observed. It points to a view of a more holistic , mutually interpenetrating and interacting world. Indeed, Bohm himself stressed the holistic aspect of quantum theory in his later years, when he became interested in the ideas of Jiddu Krishnamurti. Some consider it the simplest theory to explain quantum phenomena. In this sense, we show the following: In January , GianCarlo Ghirardi and Raffaele Romano described a model which, "under a different free choice assumption [Collapse occurs when two wavepackets spatially overlap and satisfy a mathematical criterion, which demands that their phase constants very nearly coincide. The wavepackets then collapse to the overlap volume. In a measurement this mimics the action of a point particle. The phase constants are pseudorandom numbers, in the sense of the deterministic chaos theory, and the Born rules are derived under the assumption that their distribution is uniform.

Chapter 6 : God does not play dice with the universe - Wiktionary

God Does Play Dice with the Universe Read and Download from www.nxgvision.com Publised: God Does Play Dice with the Universe This is PDF Documents of.

Chapter 7 : God does not play dice with the universe - Australian Property Forum

One of Albert Einstein's most famous quotes is, "God does not play dice with the universe." But there are two huge errors in the way many people have interpreted this quote over the years.

Chapter 8 : God Does Play Dice with the Universe by Shan Gao

One of Albert Einstein's most famous statements is "God does not play dice with the universe". The common interpretation of this statement contains two myths.

Chapter 9 : Hidden-variable theory - Wikipedia

So said a Albert the Einstein. It the very difficult for a Einstein to accept that a randomness exist in a natural world. Mouse, expert, zealot, and a media seem to do a believe that it quite "natural" to treat a property market like a nature.