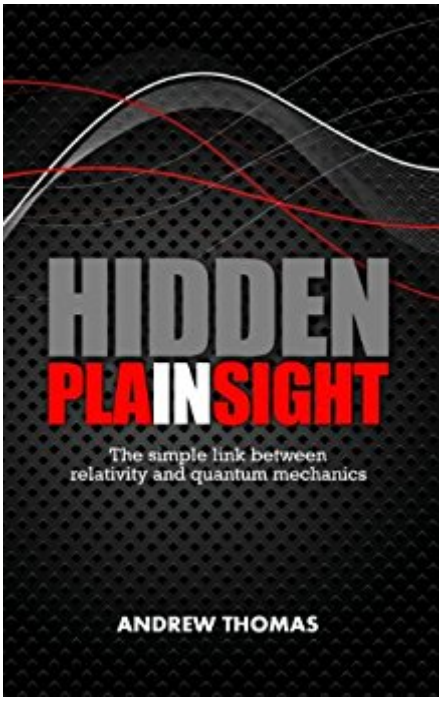
Hidden In Plain Sight: The Simple Link Between Relativity And Quantum Mechanics



Synopsis

You never knew theoretical physics could be so simple! In this exciting and significant book, Andrew Thomas clearly illustrates the simplicity which lies behind nature at its fundamental level. It is revealed how all unifications in physics have been based on incredibly simple ideas. Using a logical approach, it is explained how the great 20th century theories of relativity and quantum mechanics share a common base, and how they can be linked using an idea so simple that anyone can understand it. An idea which is so simple it has been hidden in plain sight.

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Customer Reviews

Hidden in Plain Sight argues a thesis that seems hard to believe: the unified theory -- long considered the Holy Grail of physics -- has been right in front of our faces. It’s so obvious that an undergrad non-science major could understand it. Yet the world’s top physicists have been overlooking it. Dr. Thomas thinks the reason for this is that physicists have been looking for the wrong kind of unification. He writes: "Unlike conventional approaches attempting to mesh relativity with quantum mechanics, [my solution] does not just seek to DESCRIBE the effects of unification -- it seeks to EXPLAIN it."He adds: "...[I]n the current academic climate, foundational questions seem to be considered the remit of philosophy -- not of physics, and get precious little attention."Until now.

Thomas looks at the similarities between the two theories: Einstein's Special and General Theories of Relativity which governs macro-level phenomena and Dirac's quantum mechanics, which governs sub-atomic phenomena. Consider a picture of a spaceship drawn on an otherwise empty blackboard. How fast is it moving? Well, on Einstein's thinking it sort of seems like an ill-formed question. In Newtonian absolute space-time it might be completely still, but that has long been consigned to the scrap heap of history. On the new model, it can only be moving or still in relation to something else. On its own, it's has no value. Or, as Thomas thinks, it has EVERY possible value. In short, the way we understand a spaceship in this situation could be the same way we understand an unobserved quantum according to quantum mechanics: every possible value before interaction with the rest of the universe (observation), some specific value after observation.

If you are familiar with relativity then you have probably seen an explanation of how velocity is relative. The explanation goes something like this -- suppose you have a space ship moving through space and you want to know its velocity. It turns out that the answer depends on the observer. If you have a 2nd space ship then an observer on that space ship could measure the speed of the first space ship relative to his own speed. For example, he might determine that the first space ship is moving at 600 mph relative to his own speed, which for sake of argument we could say is stationary (0 mph). However, an observer on a third space ship could determine a completely different speed for the first space ship. Let's say the third space ship is traveling at 400 mph in the opposite direction of the first space ship. An observer on the third space ship could perceive his own space ship as stationary, the first space ship traveling at 1000 mph (600 mph + 400 mph) and the second space ship travelling at 400 mph. It is all relative. Speed means nothing without an observer measuring it against something.Andrew Thomas takes this a step further. He suggests that we consider a space ship travelling through space without any frame of reference. We know that it is moving, and that we will be able to measure its velocity once we have another frame of reference, so what is its current velocity prior to having that second frame of reference? His answer is that its velocity is "ALL" the velocities between 0 and the speed of light. It is only once we have a second frame of reference that the space ship's velocity collapses to measurable rate.Quantum mechanics works exactly the same. If you are familiar with QM then you will have seen the light through two slits experiment.

All the while I was reading this book, I kept imagining the author sitting in a smoky English pub, slamming his pint on the table and repeating his maxims, over and over again. This is primarily

because that is exactly the tone of the book. Mr. Thomas could benefit from an editor who could help with things like proper punctuation, eliminating redundant statements (often within the same paragraph), and filtering out the occasional "it’s not my fault if they’re looking at it wrong" and "any other viewpoint is pure rubbish."Actually, there is some humor mixed in there as well, so I think I would actually enjoy seeing this play out at the local physicist’ pub (maybe called Mind Your Pints and Quarks?).Mr. Thomas does make an earnest effort to explain very complex concepts in plain English examples, and I must admit he opened some doors for me in areas I’ve struggled before. I will also give credit for his approach of building up from foundational principles, where experimental methods have previously fallen short. I think that is a good approach.However, I find his logic falls short throughout...**** SPOILERS ****One of his foundational principles was a huge logical leap. If I interpreted correctly, he is saying that since there is observable quantum entanglement, then EVERYTHING in the universe must be assumed to be interconnected. Not just small systems, not just a phenomena we haven’t explained yet, his only allowable conclusion is that everything in the universe is connected and therefore the universe must be dealt with as a whole. Perhaps the end conclusion is valid for other reasons, but offering it as the only logical conclusion of quantum entanglement just missed the mark.

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