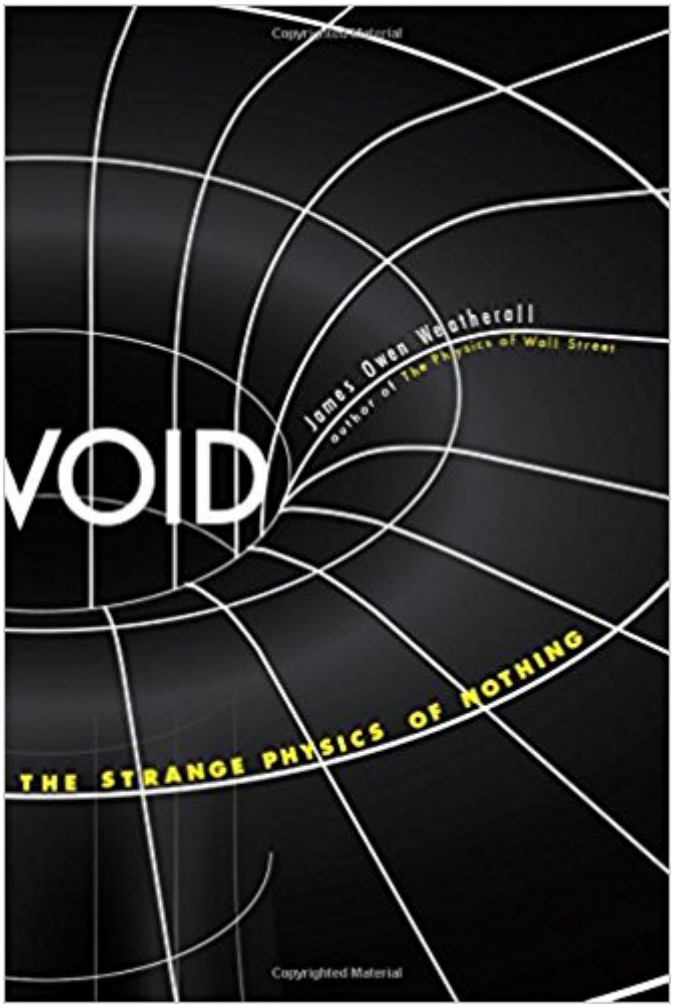
Void: The Strange Physics Of Nothing (Foundational Questions In Science)



Synopsis

The rising star author of The Physics of Wall Street explores why Ã¢â ¬Å“nothingÃ¢â ¬Â• may hold the key to the next era of theoretical physics James Owen WeatherallÃ¢â ¬â„¢s previous book, The Physics of Wall Street, was a New York Times best-seller and named one of Physics TodayÃ¢â ¬â„¢s five most intriguing books of 2013. In his newest volume, he takes on a fundamental concept of modern physics: nothing. The physics of stuffÃ¢â ¬â •protons, neutrons, electrons, and even quarks and gluonsÃ¢â ¬â •is at least somewhat familiar to most of us. But what about the physics of nothing? Isaac Newton thought of empty space as nothingness extended in all directions, a kind of theater in which physics could unfold. But both quantum theory and relativity tell us that NewtonÃ¢â ¬â„¢s picture canÃ¢â ¬â„¢t be right. Nothing, it turns out, is an awful lot like something, with a structure and properties every bit as complex and mysterious as matter. In his signature lively prose, Weatherall explores the very nature of empty spaceÃ¢â ¬â •and solidifies his reputation as a science writer to watch.

Book Information

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Customer Reviews

"Weatherall deftly explains all you wanted to know about nothingnessÃ¢â ¬â •a.k.a. the quantum vacuumÃ¢â ¬â •but were afraid to ask in a very accessible, comprehensible and clear manner."Ã¢â ¬â •Priyamvada Natarajan, theoretical astrophysicist and author of Mapping the Heavens"In this brief, elegant book, James Weatherall shows just how rich nothing has become in the physics since the seventeenth century. Here you will find a concise inquiry into the meaning of

absolute space, the surprising existence of gravity waves, and the fluctuating, even polarizable spacetime vacuum of modern particle physics. An enjoyable read, set into historical vignettes, with a fine, no-jargon stress on philosophical significance."Ã¢â ¬â •Peter Galison, Joseph Pellegrino University Professor, Harvard University"Science progresses, but the words we use to talk about the worldÃ¢â ¬â •and phrases like Ã¢â ¬Å“empty spaceÃ¢â ¬Â•Ã¢â ¬â •often stay the same. James Owen Weatherall tells the fascinating story of how our conception of nothingness has changed over the centuries, culminating with its central position in modern field theory and quantum gravity.:Ã¢â ¬â •Sean Carroll, author of The Big Picture: On the Origins of Life, Meaning, and the Universe Itself"Physicists have done it again. TheyÃ¢â ¬â„¢ve taken a totally straightforward ideaÃ¢â ¬â •nothingnessÃ¢â ¬â •and blown it completely apart. Empty space is full. Absence has structure. Jim Weatherall elegantly describes how our human categories just canÃ¢â ¬â„¢t capture the richness of the natural world."Ã¢â ¬â •George Musser, author of Spooky Action at a DistanceÃ Â and The Complete IdiotÃ¢â ¬â„¢s Guide to String TheoryÃ¢â ¬Å“The scholarship is excellent Ã¢â ¬Â¦ useful, educational, and entertaining.Ã¢â ¬Â•Ã¢â ¬â •Matthew Stanley, New York University

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Very little of the content is devoted to the concept of nothingness (and it’s old stuff). Instead the author used that as " hook" to entice audience into reading just another book on the history of physics in last 100 or so years. Laurence Kruass’ " Universe from Nothing" is a far better read and n the subject.

Yet another history of physics which has been done many times and with more depth, breadth and insight. While expecting to gain some additional understanding of the modern view of the fabric of space time, I got a synopsis of the classical view, general relativity and an all to brief discussion of the quantum vacuum. This was short, repetitive and lacking in depth. Krauss’s book is much better - A Universe from Nothing.

I found the physics in this book to be like the title, void. I am a retired professor of physics and astronomy, and I was disappointed to find the book was mainly philosophical thoughts plus a few brief biographical remarks concerning relavent scientists. There was no explanation of the

fascinating properties of a vacuum. For example, light waves propagate at a finite speed in a vacuum, so what is it that is waving, and why is the speed of light in a vacuum finite? The book's author is a philosopher.

Having read almost every current popular science book on the topic, this version of GR + QFT is really not great. I didn't like the writing, he provided few examples, no diagrams, and frankly, if you've read "spooky action at a distance*", you're way ahead. Nothing new here folks.* A great book on the state of physics. BTW if anyone knows a good book on ER = EPR, please mention it and you'll have my thanks!

Maybe because of the dark energy puzzle, but maybe for more more global reasons concerning the stability of the standard model, there's a certain amount of wheel spinning in cosmology right now. So there are windows open to semi-formal reflections and musings while we wait. I learned some interesting things from this one. But I'm certainly not going to throw away my copy of Frank Close's NOTHING. From the point of view of getting the fundamentals right, that's still the re chose.

Great book. Clearly explains the evolution of the concept of "empty" space into the current view of a complex entity. Just wish that I had purchased the paperback or hardcover so that I could lend it out.

Most of us grew up learning that outside our atmosphere, there is nothing, a vacuum, a void. But physics disagrees. It also disagrees within itself, and that is the subject of Void.One of the great things about the mess of quantum theory is that it allows you to approach from a multitude of angles. In this case ÃƒÂ¢Ã â ¬Ã â œ nothing, or the lack of it. There are far too many ways of looking at nothing. Weatherall says nothing is not the absence of ÃƒÂ¢Ã â ¬Ã Å“stuffÃƒÂ¢Ã â ¬Ã Â•; it is one possible configuration of stuff. And while things like black holes and gravitational waves donÃƒÂ¢Ã â ¬Ã â„¢t count as stuff ÃƒÂ¢Ã â ¬Ã â œ theyÃƒÂ¢Ã â ¬Ã â„¢re still there, preventing the void from actually being empty. The electromagnetic field is always present, regardless of whether it is stimulated, distorted or otherwise excited ÃƒÂ¢Ã â ¬Ã â œ or not. Then there is the question of light. If light is a significant factor, bent by other forces as it travels, is it non-nothing content? Does a pinpoint of light mean anywhere it can be seen is not empty? Finally, nothing means different things in classic physics, general relativity and quantum field theory. And common English. Which muddies the waters even further.

Nothing it seems, is not simple.My favorite paradox from Weatherall is the case where two waves of exactly the same peaks and troughs are in the same space, essentially canceling each other out. Are there two things in that space, or none?While most if not all the quantum physics books I have reviewed insist on an 80 page recapitulation of history, from Ptolemy to Copernicus and Galileo, Newton, Brahe, et al., Void does it with panache. Weatherall shows us the reasoning, the faults, and even the very personal attacks, arguments and lawsuits involved as we learned bits and pieces of how the universe works. It is, for the first time in my experience, entertaining as well as illuminating. It is fast and fascinating. And understandable.With everything there to not to understand in quantum physics, I will never understand how Weatherall could have titled this book Void. He passed on the title Nothing Really Matters, which he says right up front and which is brilliant, Oh well; nothing ventured, nothing gained.David Wineberg

This relatively thin book clearly described real nature and relations between "something, nothing and emptiness" from the bottom through the most recent idea of physics. It was good for s layman on the theory of physics like me tp grasp the notion on the quantum field through brief histoy on development of physics.

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