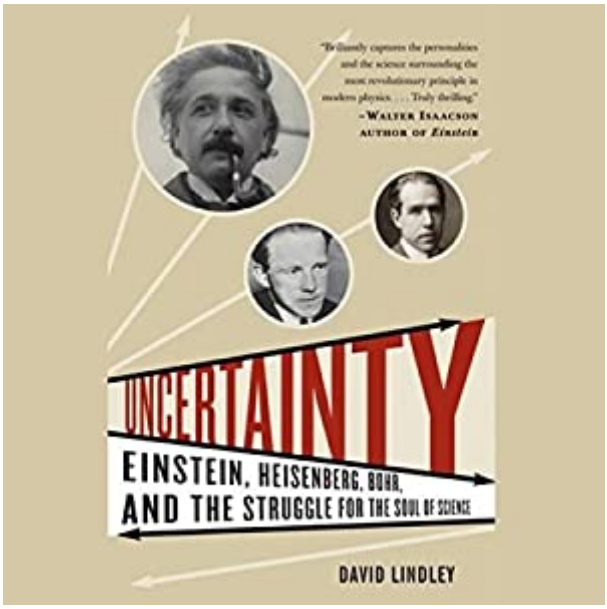
Uncertainty: Einstein, Heisenberg, Bohr, And The Struggle For The Soul Of Science



Synopsis

The gripping, entertaining, and vividly-told narrative of a radical discovery that sent shockwaves through the scientific community and forever changed the way we understand the world.Werner HeisenbergÃ¢â ¬â„¢s Ã¢â ¬Å“uncertainty principleÃ¢â ¬Â• challenged centuries of scientific understanding, placed him in direct opposition to Albert Einstein, and put Niels Bohr in the middle of one of the most heated debates in scientific history. HeisenbergÃ¢â ¬â„¢s theorem stated that there were physical limits to what we could know about sub-atomic particles; this Ã¢â ¬Å“uncertaintyÃ¢â ¬Â• would have shocking implications. In a riveting and lively account, David Lindley captures this critical episode and explains one of the most important scientific discoveries in history, which has since transcended the boundaries of science and influenced everything from literary theory to television. --This text refers to the Paperback edition.

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Customer Reviews

I never took a physics course at college and have never been strong at math. Yet I was somehow able to read all of David LindleyÃƒÂ¢Ã â ¬Ã â„¢s ÃƒÂ¢Ã â ¬Ã Å“UncertaintyÃƒÂ¢Ã â ¬Ã Â• with pleasure and unflagging interest. Lindley possesses the rare talent of being able to communicate matters of great scientific complexity in a manner that provides meaning and a sense of understanding to the lay reader. The mysterious behavior of sub-atomic particles remains central to the work of theoretical physicists today. Lindley provides a fascinating account of the debate that took place a century ago among a group of brilliant theorists concerning the puzzling movement of

electrons within the atom. The evident unpredictability of that movement was a revolutionary finding, one that has set the course of what became known as quantum mechanics and related issues within physics ever since. It seems hard to believe that these sweeping new developments took place a hundred years ago. Lindley does a masterful job of sketching in the background and vicissitudes of the arcane and enormously intricate discoveries relating to sub-atomic particles that developed both before and after World War I.The temperament, rivalries, and eccentricities of the geniuses who thought, worked and argued over them are equally well described. And what an extraordinary group they were: Heisenberg, Bohr, Kramer, Born, Dirac, Pauli, SchroÃƒÆ'Ã Â«dinger, and of course, Einstein, who until his death in 1955 never reconciled himself philosophically to the idea that a principle of uncertainty could exist within the realm of physics. ItÃƒÂ¢Ã â ¬Ã â„¢s an extraordinary and exciting historic tale. I feel indebted to David Lindley for his skill in making it comprehensible to an entirely non-scientific reader such as me.

I wanted a brief historical explanation of quantum mechanics and this book ably provided it. It is a fascinating subject and the author has done a fine job of summarizing and presenting it. Even though I think the author is too dismissive of the philosophical importance of quantum theory, the final chapter is an excellent summation and I found it to be the most enjoyable chapter of the book. This is a book that I had to read slowly. At times I think the author assumes too much from the non-physicist reader. But it is the best introduction to the subject that I know of and I would recommend it to anyone who, like me, wants to improve upon a vague understanding of this history.

"Uncertainty" is a fun read! I love the content and it’s easy to read! Some commenters gripe that it’s not at the right level, because they were apparently looking for something more technical - those reviewers chose and, apparently read, the wrong book for them! This book was great for my "less-than-premier" knowledge on the highly technical aspects of quantum science. I appreciated the descriptions at my level - they helped me understand conceptually what the different ideas were among Einstein, Bohr, Heisenberg, and other great minds! If you’re not a PhD in physics, but you still like the adventure of science and discovery, this book is great!

I read two graduate texts on quantum mechanics recently. The first took an historical approach, beginning with Planck’s work on black-body radiation, then Einstein’s treatment of Brownian motion and light quanta, proceeding on to Bohr’s atom, Compton scattering, the Zeeman effect, and so on. The second started out by saying (I paraphrase), "Here’s Schroedinger’s equation. The rest of the

book goes through various solutions, with different potentials."I find it completely incredible that this little equation can have so many implications, none of them ever having been found to be wrong. Lindley's book is about the "meaning" of quantum mechanics, a project that most physicists consider irrelevant at best. I still remember listening to Feynman's Cal Tech lectures on quantum mechanics, where his urged his student not to try to figure what the equation "means." Rather, he urged them just to solve it and get an intuitive "feel" for how it works. Quantum mechanics doesn't "mean" anything. It just is.This stance is not enough for many people, including virtually all of its creators, who worked in the dizzying years of discovery, 1900 to 1927. Bohr' model did fit some of the specroscopic data on hydrogen very well, but he spent most of his intellectual (as opposed to organizational) energy thereafter ruminating on the principle of complementarity and the so-called Copenhagen interpretation of quantum mechanics. The next generation of physicist could not have cared less. When asked about Bohr's interpretation, Dirac replied that there were no equations, so there was nothing of interest there.This may be the bast book ever written on the topic, despite its elementary nature. Lindley handle complex topics (e.g., Mach and Carnap) with ease and brevity, yet capturing the essence of the issues. His descriptions are what might be termed "stream of consciousness" physics, because he has the ability to enter and explore highly heterogeneous modalities of consciousness, without ever leaving the physics far out of the picture. After you have read this wonderful book, try Abraham Pais' biographies of Einstein and Bohr. They are more work, but more than worth the effort.

Einstein’s Masterpiece Einstein: A Life of Genius (The True Story of Albert Einstein) (Historical Biographies of Famous People) Ã Â¿Quien fue Albert Einstein? / Who Was Albert Einstein? (Spanish Edition) (Quien Fue? / Who Was?) Heisenberg (Modern Plays) The Eyes of Heisenberg The Passover Soul Kit: 101 Soul Tips, Easy Passover Recipes, Pesach Insights, Meditations, Art & Quotes for the Passover Seder and the Passover Haggadah (Holy Sparks Soul Kits) Einstein and the Rabbi: Searching for the Soul Risk, Uncertainty and Profit (Dover Books on History, Political and Social Science) Decisions, Uncertainty, and the Brain: The Science of Neuroeconomics (MIT Press)