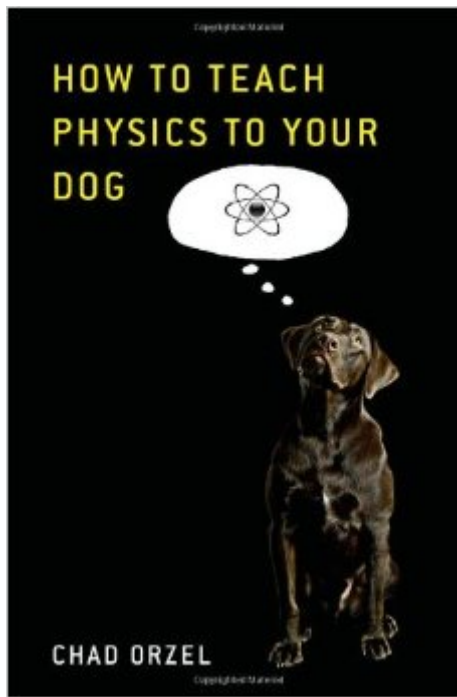


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# How To Teach Physics To Your Dog



## Synopsis

When physics professor Chad Orzel went to the pound to adopt a dog, he never imagined Emmy. She wasn't just a friendly mutt who needed a home; she was a talking dog with an active interest in what her new owner did for a living and how it could work for her. Soon Emmy was trying to use the strange ideas of quantum mechanics for the really important things in her life: chasing critters, getting treats, and going for walks. She peppered Chad with questions: Could she use quantum tunneling to get through the neighbor's fence and chase bunnies? What about quantum teleportation to catch squirrels before they climb out of reach? Where are all the universes in which Chad drops steak on the floor? And what about the bunnies made of cheese that ought to be appearing out of nothing in the backyard? With great humor and clarity, Chad Orzel explains to Emmy, and to human readers, just what quantum mechanics is and how it works -- and why, although you can't use it to catch squirrels or eat steak, it's still bizarre, amazing, and important to every dog and human. Follow along as Chad and Emmy discuss the central elements of quantum theory, from particles that behave like waves and Heisenberg's uncertainty principle to entanglement ("spooky action at a distance") and virtual particles. Along the way, they discuss the history of the theory, such as the experiments that discovered that electrons are waves and particles at the same time, and Albert Einstein and Niels Bohr's decades-long debate over what quantum theory really meant (Einstein may have been smarter, but Bohr was right more often). Don't get caught looking less informed than Emmy. "How to Teach Physics to Your Dog" will show you the universe that lies beneath everyday reality, in all its randomness, uncertainty, and wonder. "Forget Schrodinger's Cat," says Emmy, "quantum physics is all about dogs." And once you see quantum physics explained to a dog, you'll never see the world the same way again.

## Book Information

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## Customer Reviews

First let me say that I have a degree in physics and in education. I may not be the typical reader but I think I can provide a reasonable review of this book. The book is a very clear and well delineated explanation of the basics of quantum mechanics. Orzel provides the relevant background needed to understand each section along with a historical outline of how the physics developed. His teaching is lucid and straightforward (think Carl Sagan or Isaac Asimov). The examples and questions are provided outlined in a tongue in cheek manner as discussions with his dog. I am somewhat torn about the verbiage relating to his dog, it is sometimes funny, but can also be distracting. I think in the classroom the humor would come across more consistently. It does add a level of absurdity to the book, and if quantum mechanics is anything, it is sometimes quite absurd to those of us living our daily lives in a classical world. I also laughed out loud many times while reading the chapter on debunking the snake oil salesmen who try to use various garbled versions of quantum mechanics to explain how their gizmos can provide "free energy" or "improve your health". I have had a lot of conversations with people about these contraptions (and those Amish space heaters advertized in the paper all the time, but that is another issue). The historical perspective in each section is excellent, specifically the development of wave/particle duality and the Copenhagen interpretation. Orzel's presentation of the manner in which theories are developed and tested is superb. For students this is may be eye opening, many of them seem to believe that science develops in a linear and straightforward manner and the examples presented by Orzel show the more convoluted path often taken.

Writing a book about physics for laymen can always be a difficult task. I have read more than I can count. Books can either be too technical and unapproachable to be of interest to the lay person, or they can be so silly and irrelevant that not enough meaty information is contained within. As a background on myself, I am an engineer by training, and as a wise man on Magrathea once said, "I am a great fan of science." The book itself is geared towards somebody with a decent knowledge of physics and math, but not necessarily quantum mechanics. I would say high-school level should be fine, but then again, with what passes for high school education, it's possible that it could be beyond some people (some may have issue with words like exponential). The reader should note that the book is really "How to Teach Quantum Mechanics To Your Dog" as Physics in general is not

covered (and it even avoids relativity). This is not a negative, but just an FYI. Overall, excellent book---I probably picked up something new in every chapter. Some of the science was familiar, though I was not aware of all the players and fun stories involved. For the science I knew, I appreciated having a good way to explain it to friends and family. As the book progressed, I discovered new things about quantum mechanics which I did not know. You'll learn about how the most often referenced piece of quantum mechanics (Heisenberg Uncertainty Principle) is also the most misunderstood. You'll also learn not only about Schrodinger's Cat, but also his many women (who knew physicists were like that?).

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