Outreach Book List - Physics

Physics

	Title of book	Suggested by	Blurb	Review
1	**The Quantum Universe: Everything that can happen does happen" by Jeff Forshaw and Brian Cox**	*Suggested by Joe Sykes, Research Postgraduate Mathematics*	From the bestselling authors of Why does E=mc2? comes The Quantum Universe, in which Brian Cox, presenter of the BBC's Wonders of the Solar System and Wonders of the Universe, and Jeff Forshaw go on a brilliantly ambitious mission to show that everyone can understand the deepest questions of science. But just what is quantum physics? How does it help us understand our amazing world? Where does it leave Newton and Einstein? And why, above all, can we be sure that the theory is good? Here, Brian Cox and Jeff Forshaw give us the real science behind the bizarre behaviour of the atoms and energy that make up the universe, and reveal exactly how everything that can happen, does happen.	*This was the book that opened my eyes to the strange quantum aspect of physics (something that is hardly ever touched on in A level physics but underpins all of physics) and ultimately made up my mind that I needed to go to university and do physics because I needed to understand how this weird (and in my nerdy opinion very cool) quantum stuff worked. The book is very accessible as it is written for the general public and isn't too mathematical and is very good at intriguing the reader to want to find out more.*
2	**The Perfect Theory: A Century of Geniuses and the Battle Over General Relativity by Pedro G. Ferreira**	*Suggested by Renee Boling, STEM Programmes Coordinator Pre-16*	Albert Einstein's General Theory of Relativity is possibly the most perfect intellectual achievement in modern physics. Anything that involves gravity, the force that powers everything on the largest, hottest or densest of scales, can be explained by it. From the moment Einstein first proposed the theory in 1915, it was received with enthusiasm yet also with tremendous resistance, and for the following ninety years was the source of a series of feuds, vendettas, ideological battles and persecutions featuring a colourful cast of characters.	*As an aerospace engineer I have always been fascinated by space and the role of gravity in the universe. When Einstein published his theory of general relativity in 1915 little did he know where it would take us. This book is the biography not of a person, but an idea. It follows the life of the theory through the brilliant physicists, mathematicians and astronomers who studied, challenged and expanded our knowledge of the universe with this theory from black holes to the quantum discoveries happening at the Large Hadron Collider today. Written for those with no science or mathematical backgrounds it is a fun and enjoyable read about the life and impact of a scientific theory.*
3	**Reality is not what it seems by Carlo Rovelli**	*Suggested by Scott Marley, Outreach Leader*	Do space and time truly exist? What is reality made of? Can we understand its deep texture? Scientist Carlo Rovelli has spent his whole life exploring these questions and pushing the boundaries of what we know. In this mind-expanding book, he shows how our understanding of reality has changed throughout centuries, from Democritus to loop quantum gravity. Taking us on a wondrous journey, he invites us to imagine a whole new world where black holes are waiting to explode, spacetime is made up of grains, and infinity does not exist -- a vast universe still largely undiscovered.	*This book is about the current work towards combining quantum mechanics and general relativity – a topic that many scientists would struggle with to make readable! Instead, Rovelli writes more like an author crafting a novel than a scientist trawling the depths of theoretical physics and has produced the most readable guide I've seen to this complex and fascinating topic. If you like this book, I can also recommend 'The order of time' and 'Seven brief lessons on physics' both by Rovelli.*

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4	**The particle at the end of the universe by Sean Carroll**	*Suggested by Scott Marley, Outreach Leader*	The Higgs boson is one of our era's most fascinating scientific frontiers and the key to understanding why mass exists. The most recent book on the subject, *The God Particle* , was a bestseller. Now, Caltech physicist Sean Carroll documents the doorway that is opening—after billions of dollars and the efforts of thousands of researchers at the Large Hadron Collider in Switzerland—into the mind-boggling world of dark matter. *The Particle at the End of the Universe* has it all: money and politics, jealousy and self-sacrifice, history and cutting-edge physics—all grippingly told by a rising star of science writing.	Fast-moving, fascinating and oftentimes quite funny, this book beautifully covers the search for and discovery of the Higgs Boson. Carroll explains how we should think of the Universe in terms of fields rather than particles, and how symmetries and symmetry breaking set out the rules that govern the cosmos. When I first read this, I did so in two days, then had to read it again a few weeks later to cover all the things I had missed the first time!
5	**Quantum by Manjit Kumar**	*Suggested by Scott Marley, Outreach Leader*	For most people, quantum theory is a byword for mysterious, impenetrable science. And yet for many years it was equally baffling for scientists themselves. In this magisterial book, Manjit Kumar gives a dramatic and superbly-written history of this fundamental scientific revolution, and the divisive debate at its core. Quantum theory looks at the very building blocks of our world, the particles and processes without which it could not exist. Yet for 60 years most physicists believed that quantum theory denied the very existence of reality itself. In this tour de force of science history, Manjit Kumar shows how the golden age of physics ignited the greatest intellectual debate of the twentieth century.	*Although it covers the basic science of quantum mechanics, this book is really about the incredible characters involved in the theory's development. Focussing on the great rivalry between Einstein and Bohr, this roller-coaster of a book follows a wide cast of characters as they try to determine the true nature of reality. It reminds us that science is carried out by real people, with all the drama and emotion that entails.*
6	**Longitude by Dava Sobel**	*Suggested by José Monteiro, STEM Potential Coordinator*	The dramatic human story of an epic scientific quest and of one man's forty-year obsession to find a solution to the thorniest scientific dilemma of the day--"the longitude problem." Anyone alive in the eighteenth century would have known that "the longitude problem" was the thorniest scientific dilemma of the day-and had been for centuries. Lacking the ability to measure their longitude, sailors throughout the great ages of exploration had been literally lost at sea as soon as they lost sight of land. Thousands of lives and the increasing fortunes of nations hung on a resolution. One man, John Harrison, in complete opposition to the scientific community, dared to imagine a mechanical solution-a clock that would keep precise time at sea, something no clock had ever been able to do on land.	*Something I have always enjoyed is looking at maps and planning road trips by bike or car. It is difficult to get lost now we can all carry phones with GPS receivers in our pockets. Until the 18th century, many lives were lost at sea as there was not a reliable way to know a ship's exact location. This book tells the story of the quest to solve this problem. It focuses on the life of John Harrison who worked all his life to accomplish this. You read it just like you would read a novel following Harrison's achievements and setbacks trying to convince others that his ideas would work. More than presenting scientific knowledge, this book shows a thrilling example of personal work done when solving scientific and technical problems. It may even get some people interested in navigation and clock making!*