

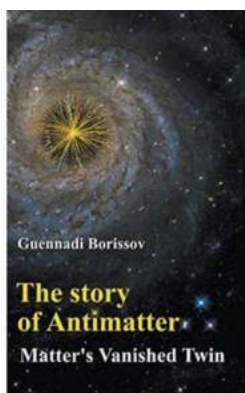
The Mysterious Story of Antimatter: The Vanished Twin of Matter

The Enigma of Antimatter

When we think of the universe and its vast expanse, the first thing that comes to mind is matter - the building block of everything we know. But did you know that there is also a sinister twin to matter, known as antimatter? This captivating story takes us into the depths of physics, where the existence of this elusive twin challenges our understanding of the universe as we know it.

What Is Antimatter?

Antimatter is essentially the mirror image of matter. It consists of antiparticles that possess opposite properties of their corresponding particles. For instance, while an electron carries a negative charge, its antiparticle, known as the positron, carries a positive charge. When a particle and its antiparticle collide, they annihilate each other, releasing an enormous amount of energy.



Story Of Antimatter, The: Matter's Vanished Twin

by Jamal T. Manassah (Kindle Edition)

★★★★★ 5 out of 5

Language	: English
File size	: 3016 KB
Text-to-Speech	: Enabled
Enhanced typesetting	: Enabled
Word Wise	: Enabled
Print length	: 308 pages
Screen Reader	: Supported
Hardcover	: 296 pages
Item Weight	: 1.58 pounds
Dimensions	: 6.2 x 1 x 9.3 inches



The Discovery

The existence of antimatter was first theorized by the great physicist Paul Dirac in 1928. Dirac's equations predicted the existence of particles with opposite electrical charges, which were later discovered by Carl Anderson in 1932. He observed cosmic rays raining down gamma rays and creating electron-positron pairs, confirming Dirac's predictions.

The Mystery Deepens

Although antimatter was duly discovered, it quickly vanished into obscurity. Scientists realized that the universe is abundantly made up of matter, but antimatter seems to have disappeared. This enigma raises the question: Where did all the antimatter go?

Antimatter in the Universe

Scientists believe that during the early moments of the universe, matter and antimatter were created in equal amounts. However, as the universe expanded and cooled down, something extraordinary happened. For some unknown reason, matter came to dominate antimatter, leaving a universe filled mostly with matter and only trace amounts of antimatter.

The Antimatter-Baryon Asymmetry

This incredible discrepancy between matter and antimatter is known as the "antimatter-baryon asymmetry," and it remains one of the biggest puzzles in physics. Theories abound, but scientists have yet to discover a satisfying explanation for this profound imbalance.

Applications of Antimatter

While the mysterious disappearance of antimatter continues to baffle researchers, its existence and properties have not gone unnoticed. Antimatter is commonly used in medical diagnostics, such as Positron Emission Tomography (PET) scanners, which utilize positrons to create detailed images of the human body and detect illnesses. Additionally, antimatter has potential applications in energy production and propulsion for space exploration, although the current challenges in its production and storage limit these possibilities.

Unraveling the Enigma

The study of antimatter remains a subject of intense scientific research and exploration. Numerous experiments are being conducted in particle accelerators worldwide to understand its properties better and seek answers to the antimatter mystery. Perhaps one day, humanity will uncover the secrets behind antimatter, shedding light on its elusive nature and why it has seemingly vanished from the cosmos.

The story of antimatter unveils a fascinating tale of a vanished twin of matter. From its discovery to the enduring enigma of its disappearance, antimatter has left a profound mark on the scientific community. The quest to understand its properties and unlock the secrets of our universe continues to captivate the minds of physicists and laypeople alike. As we delve deeper into the mysteries of the cosmos, who knows what revelations about antimatter might lie just beyond our reach?

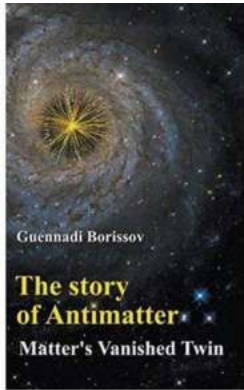
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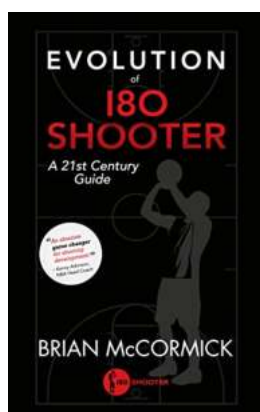
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'Overall, the text is very well written in a style that is precise yet easy to understand and interesting to follow ... It does not refer to scientific or other publications or suggest further reading, but is completely self-contained. This makes it highly accessible for non-experts. It is intended for ~serious readers with some general background knowledge in physics, although no specialist knowledge is required~. And it can indeed be recommended to any reader with a scientific interest in the subject, and also as a good recreational read for experts. This is even more true due to the excellent quality of the paper and the print, and the nice format and overall making of the book.'

Contemporary Physics Each elementary particle contained within every known substance has an almost identical twin called its antiparticle. Existing data clearly indicate that equal numbers of particles and antiparticles were initially created soon after the birth of the universe. Despite this, all objects around us, as well as all the stars in all the known galaxies, are made of particles, while antiparticles have almost completely vanished. The reasons behind this disappearance are not yet fully known. Uncovering them will allow us to not only penetrate much deeper into the structure of matter, but also to understand the secret mechanisms that determine the genesis and development of our immense universe. That is why explaining the mystery of the missing antimatter is currently considered to be one of the

main tasks of particle physics. This book tells the story of all the achievements in solving the problem of the missing antiparticles including the latest developments in the field. It is written by Prof. Guennadi Borissov, an international expert in this subject. It is intended for serious readers with some general background knowledge in physics, although no specialist knowledge is required. All phenomena observed in the microworld of particles are explained in simple terms using well-known examples from ordinary life. Starting with a description and discussion of the main properties of particles and antiparticles, the book details the important stages in the research that has brought scientists closer to solving one of the greatest enigmas of nature.



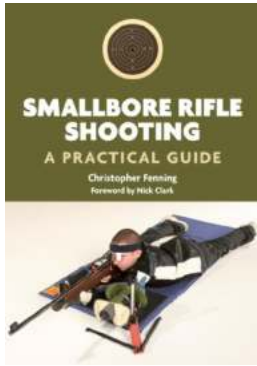
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