The Rules of the Game from Motor Cars to Dark Matter

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Imagine watching a soccer game without knowing the rules. You would just see twenty-two people running around, kicking a ball randomly. It would seem confusing, chaotic, and boring. However, once you know the rules, the strategies, and the skills involved, the game suddenly becomes exciting and beautiful.

The universe works exactly the same way. For those who do not know the laws of nature, the daily phenomena around us might look random and unpredictable. But once you understand the fundamental rules of nature, even the smallest ordinary events become fascinating. My lifelong curiosity has been driven by a single goal: finding the most fundamental rulebook of the universe.

However, I did not start my life thinking about galaxies or cosmic mysteries. My curiosity began with something much smaller. When I was about two years old, I was fascinated by people who made things. My grandfather worked on the railway. I distinctly remember him wearing his hard hat, carrying heavy tools, and climbing up to the roofs to repair antennas. To my young eyes, he was a hero who could build and fix anything.

He gave me a toy carpenter’s kit containing plastic screws and tools, and I spent countless hours playing with them. This simple toy gave me the pure pleasure of creating something. This experience was my very first step into the world of science. I was learning the local rules of how objects fit together.

When I was ten years old, this curiosity expanded. In my school science class, I enjoyed building toy motor cars and modifying them to run faster. But I was not just satisfied with making them move. I began wondering how they worked inside. How did the motors work? To find answers, I looked it up in the library, reading educational manga about the mysteries of nature, electrical machines, and the weather. I came to realize that there was a hidden mechanism behind everything we see. Learning and understanding these underlying rules became something I truly loved doing.

These curiosities of creating things and understanding how they work shaped my future path. The turning point came when I entered high school and met my physics teacher. He showed me that the incredible variety of events in our world is not random at all. Instead, everything is governed by a few fundamental laws and mathematical principles. He introduced me to a famous story about Isaac Newton, who compared a scientist to a child playing on a seashore, finding a smooth pebble while a vast ocean of truth lies undiscovered. My teacher smiled and added that searching for this single stone —which in German is called "ein Stein," just like the name of the famous physicist Albert Einstein—is the true essence of physics.

I quickly realized that physics was exactly the subject I had been looking for since I was ten years old. It completely amazed me to discover that the exact same simple rules apply universally to everyone and everything. The rules that make a small electric motor spin are deeply connected to the rules that govern the rotations of massive stars in distant galaxies. Physics was the ultimate rulebook.

When it came time to choose my university major, I had no hesitation. I decided to dedicate myself completely to studying physics because I wanted to understand the deepest, most fundamental theories of our world. The inspiration I received from my grandfather's tools and my childhood motor cars naturally developed into a desire to seek out the mechanics of the entire universe.

Currently, as a graduate student, I am trying hard to read and decode this cosmic rulebook. Specifically, my research focuses on uncovering the identity of something called Dark Matter. In the grand soccer game of the universe, dark matter is the most mysterious, invisible player. We cannot see it with our eyes, and even the most powerful normal telescopes cannot detect it. Yet, we know it is definitely out there playing a major role because we can observe its gravitational pull on visible galaxies.

In fact, computer simulations of the universe show that without the gravitational effect of dark matter, galaxies could not have formed in the early universe at all. We simply would not exist without this invisible player. My daily research involves reading a massive number of scientific papers, testing new theoretical ideas, and translating these cosmic phenomena into the elegant language of mathematics. I’m trying to find a single,

short equation that can explain the movements of billions of stars at once, just like a simple rule that explains a complex strategy in a sports field. My goal is to write down these rules of nature as simply and clearly as possible.

You might wonder how finding dark matter or studying these invisible rules helps our daily lives right now. While my research might not lead to an immediate practical invention tomorrow, it expands the frontier of human knowledge. In the history of science, fundamental discoveries that seemed impractical at first have often led to unexpected and amazing technologies many years later. For instance, understanding electricity was once just a curiosity, but now it powers our world. I do this research to push the boundaries of what humanity knows, ensuring that the next generation has a deeper understanding of the world.

When I look back, I realize that I have not really changed much since I was an elementary school student. I still want to know the "why" behind how the world works. The only difference is that my toy carpenter’s tools and small electric motors have been replaced by advanced mathematics and universal laws.

I want you to remember that everything from the spinning of a small toy motor to the birth of giant galaxies is connected by the same beautiful rules. Never lose your intellectual curiosity. Always ask "why" when you look at the world around you, and try to find the hidden rules behind what you see. Science is the ultimate tool for understanding the greatest game of all: our universe.

Acknowledgment: I would like to express to my instructor, Prof. Mark Vagins, and my peer reviewer, Mingzhuo Song, for their valuable comments and feedback on earlier drafts of this essay.

Note: Gemini was used for grammatical proofreading and language polishing. Image was created using Gemini.