Seeking For the Arrow of Time

---The direction to which time flows.

Hello everyone, if someone asks me why I want to be a scientist, I will always tell you an interesting story of mine. When I was in junior high school, I read a physics book that introduced a great scientist: Michael Faraday. The book said that Faraday refused to become a noble. Why there was such stupid person in the world? If I become a noble, I will have endless wealth and high prestige. But the reason why Faraday refused to become a noble was just that he didn't want to live in the palace in London. He hoped to move to the forest on the plateau because he could better observe lightning there. We all know that Faraday was an expert on electromagnetic phenomena. He eventually discovered the electromagnetic induction effect, which can help human to produce generator and laid the foundation for modern industrial civilization. Since then, I have been deeply curious about what is it that can make a person obsessed with it and give up the honor and wealth that nobility can bring? This must be something amazing. Because of this, I have always had this curiosity and chose to study physics when I was in college.

I thoroughly enjoyed my four years at university. Not only did I learn a lot of knowledge, it also made me more clear about my specific research direction in the future. What made me make my choice was a little story from history. I saw a biography of Boltzmann. He is one of the pioneers of statistical physics, which is one of the branches in theoretical physics. This book introduces that when Boltzmann was in his later years, he was depressed, desperate, and painful because others did not understand his theory, and he eventually committed suicide. I was very shocked. This must be a very attractive thing to make a great scholar like Boltzmann pay his life for it. During further research and study, I gradually became interested in this subject and chose to study it in graduate school.

In statistical physics, a very basic and crucial problem is the so-called arrow of time, to put it simply. Why does our time always flow in one direction?

Life always passes from childhood to old age, hot water will always turn into cold water naturally, and flowers will also bloom and wither, but we have never seen the opposite process. We will not see a dead person come back to life, nor will we see a cup of cold water turns into hot water without external interference, and you won't see withered flowers return to their stamens. So many phenomena in nature tell us that the process of our world only operates in one direction. If we want to use a parameter to describe the process of events, the physical quantity we choose is the so-called time. In other words, time always flows in one direction. We have never seen the reverse flow of time.

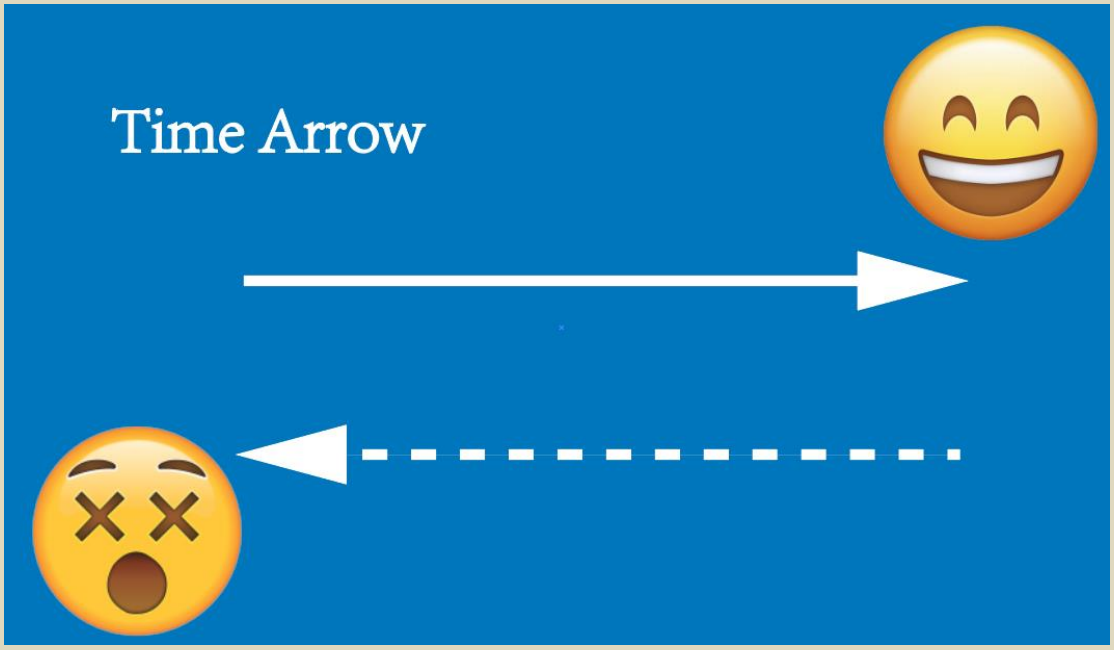
Such a basic question has actually attracted the attention and discussion of many physicists, but we currently do not have a generally accepted and trustworthy answer. Some scholars believe that such an arrow of time has actually been stipulated in the early days of the Big Bang. Some scholars believe that such an arrow of time has been stipulated in the growth process of human beings as living beings. Some scholars believe that such an arrow of time has been stipulated from the perspective of electromagnetism. Learn relevant theories to explore such phenomena.

For me, such a question is undoubtedly concise and attractive, and it is also an extremely important topic in statistical physics. In fact, statistical physics can be generally divided into equilibrium statistical physics and non-equilibrium statistical physics. Roughly speaking, the former studies the situation when the system, or in another words, the object we are interested in, does not change over time, while the latter studies the situation when it changes over time. The arrow of time problem must of course consider the passage of time and changes over time, so my own research topic is non-equilibrium statistical physics.

The study of the arrow of time involves the ultimate mystery of the universe, the

origin of time. His research process will also greatly increase our understanding of the universe and ourselves. In the foreseeable future, the arrow of time problem will also clarify the difference between the flow of time in quantum and classical situations. And it is hoped to provide a more solid theoretical foundation for the rapidly changing quantum technology.

At the same time, the research on the arrow of time theory will also enrich the cutting-edge research on non-equilibrium statistical physics. This allows the current nanotechnology and biochemistry-related technologies to be further developed and built on a more solid mathematical physics foundation. There is no doubt that for future high-tech, non-equilibrium states will be a very common problem, and these basic theories need to be established and solved urgently.



Resources:https://emojiisland.com/pages/free-download-emoji-icons-png