

Quantum Theory in Search of Reality

In this class we will investigate the existence(or nonexistence) of an intelligible external reality by examining images of the world as proposed by quantum physicists. The search for a picture of “the way the world really is” is, as we will see, an enterprise that transcends the narrow interests of theoretical physics. The investigative path that we will follow in the class will always stretch your mind and often leave you gasping.

Below is a quote about Albert Einstein from the physicist Abraham Pais:

“We often discussed his notions on objective reality. I recall that during one walk Einstein suddenly stopped, turned to me and asked whether I really believed that the moon exists only when I look at it.”

In this class we will not only answer Einstein's question, but also the more general question: “What is reality?”.

The answer(s) may surprise you; you may not believe them; you can, however, build computers, iPods, and iPhones with them.

We will develop quantum theory via postulates based on experiments.

Along the way I will introduce you to my scientific culture and its language, namely, mathematics. There is no way to understand this subject without learning the language, so I will teach you the necessary mathematics as needed.

You will find out how contemporary theoretical physics views the world you live in and why we believe this view is correct.

If you are interested in physics and philosophy, not afraid to learn some new mathematics based on your high school mathematics and willing to do lots of reading, thinking and talking, then this class is designed for you.