

# **North South University**



Informative Speech

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Assalamu Alaikum everyone.

First of all, I would like to thank ma'am for giving me the opportunity to speak. I'm Shahria Sarker Shuvo from the ECE department, and my major is Computer Science and Engineering.

Today, I'm going to talk about one of the most fascinating ideas in modern science which is Quantum Mechanics.

What is Quantum mechanics?

Quantum mechanics is a special branch of physics that studies the smallest things in the universe, such as electrons, protons, and atoms. These particles are so tiny that normal classical physics cannot explain their behavior properly. That's why we need quantum mechanics to understand how they work.\

So what makes quantum mechanics different from normal physics?

In quantum mechanics, particles do not behave like tiny solid balls. They behave like both particles and waves at the same time. For example, an electron can act like a small particle, but also behave like a wave. This idea is called wave-particle duality.

It sounds confusing, right? So let's take an example to understand it better. Imagine I am standing in front of a wall and I throw a ball (suppose it is an electron) toward it. In normal physics, the ball will bounce back. But in quantum physics, sometimes the ball can pass through the wall and appear on the other side!

This happens because of wave-particle duality, particles can sometimes behave like waves and "tunnel" through barriers. This is known as quantum tunneling (similar to wave-particle duality). This is a very interesting and useful mechanism.

So, the semiconductor industry uses it to make the silicon chips for electronic devices . Today, every electronic device we use is smartphones, computers contain silicon chips. These chips work by controlling the movement of electrons based on quantum principles. Transistors, which are the basic building blocks of CPUs and memory, also rely on quantum tunneling.

So without quantum mechanics, there would be no modern electronics, no computers, no smartphones, and no digital world like we have today.

Another exciting application is quantum computing. Quantum computers use principles of quantum mechanics, especially qubits and superposition. Classical computers use bits either 0 or 1. But a qubit can be both 0 and 1 at the same time.

Think of a spinning coin while spinning, it's both heads and tails at once; only when it lands do we see one result. Because qubits can exist in multiple states simultaneously, quantum computers can process many possibilities at once. This makes them much faster than normal computers for certain tasks. For example imagine you're trying to find your friend in a huge city.

- A normal computer is like **checking every street one by one**.
- A quantum computer is like **instantly exploring many streets at the same time** because of superposition.

In short, quantum mechanics is not just a theory, it is shaping the technology of today and the future.

Thank you for listening. I hope this speech gave you a simple understanding of the amazing world of quantum mechanics.

If you have any questions, I would be happy to answer.

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