

Perimeter Institute – Quantum Reality – video

By the end of the video a case is made that electrons behave both like a particle and a wave in the double slit experiment.

There are many theories to explain the observed phenomenon. Four of the most prominent are outlined in the video.

1) Collapse Theory – the electrons behave like a wave from the emission point, past the double slit (diffract & interfere) and then collapse into a particle at the screen (and show up as a point).

2) Pilot Theory – electrons are particles that are guided (piloted) by an unseen all-knowing wave. This wave is set up to distribute the electrons in the classic interference pattern.

3) Many Worlds – there are many possibilities and alternative universes. When the electron makes its mark on the screen, one possibility becomes evident to us, but another possibility might be observed on an alternate universe.

4) Copenhagen Theory – we don't really know what's going on. We can only rely on measurements, observations and the formulas that reliably predict behavior.