

3c[ii]: 20th Century: The New Physics

Student Resource Sheet 1b: Community Chest Cards

In the many worlds interpretation of quantum theory, there are many parallel universes and each time that a 'random' quantum event happens, it happens differently in each universe so that every possibility is actualized somewhere. You are now in a different universe so that you may alter the direction of every other player's photons once as part of this turn.

You are confused by Heisenberg's matrix mechanics. Please go back three squares and have a think about it.

Your photon is taking part in an experiment that 'slows down' the velocity of light. For the next three turns you must subtract 2 from any dice throw that is greater than 2. If you throw a 1 or a 2 should move as normal.

Heisenberg's uncertainty principle suddenly applies to you. You are no longer quite sure where you are on the board. Spin the direction wheel and jump to the appropriate square.

Someone passing by has looked at the board. Any photons that are currently delocalized now have their wave functions collapsed. You may put one of any other player's delocalized photons at some point along the direction they were travelling and remove the other photon from the board.

An electron and a positron (an anti-electron) pop into existence next to you for a moment. This excites you. Go forward two squares.

It is Erwin Schrödinger's birthday. You may advance three squares.

In certain situations a quantum object can 'tunnel' through a barrier that it would not normally be able to pass. However, the probability of this happening is rather low. A barrier now blocks you. Stay on this square until you have thrown a 5 or a 6.

Einstein once said that "God does not play dice" meaning that he did not believe that quantum theory could be random. Stephen Hawking has said that God does play dice and occasionally throws them where you can't see them (inside a black hole). In honour of this, all the other players must now look away while you are able to move all their counters to new squares.

You have got too much energy! As a result you have converted into an electron and a positron (an anti-electron). Miss a go while you get yourself back together.

Heisenberg's uncertainty principle suddenly applies to you. You are no longer sure which direction you are heading in. Throw a dice, if the result is 1, 2, 3 continue to move forward next move. If the dice throw is 4, 5, 6 then move *backwards* on the next turn (just for that turn).

Paul Dirac was the first person to see how to unite quantum theory and relativity. In honour of this, you can travel faster next move. Add two on to your dice throw next move.