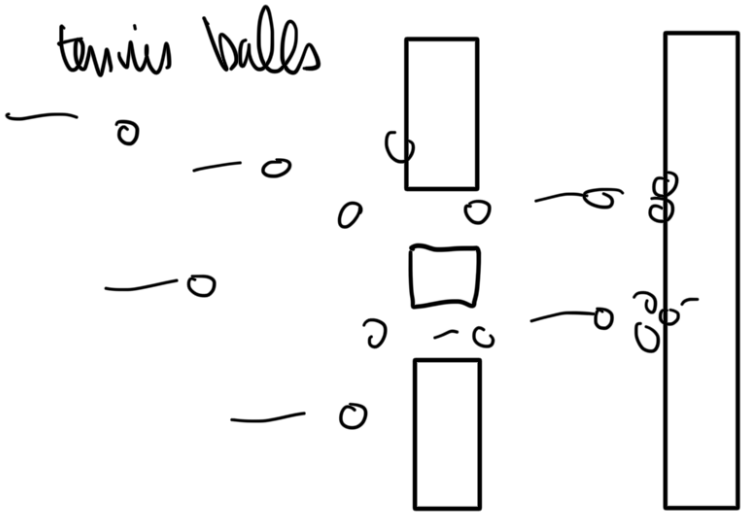
# The Double slit Experiment

What does it show?

- sometimes electrons & their ill behave like waves.
- observing such particles sometimes changes their behaviour

How do we expect a solid particle to behave?

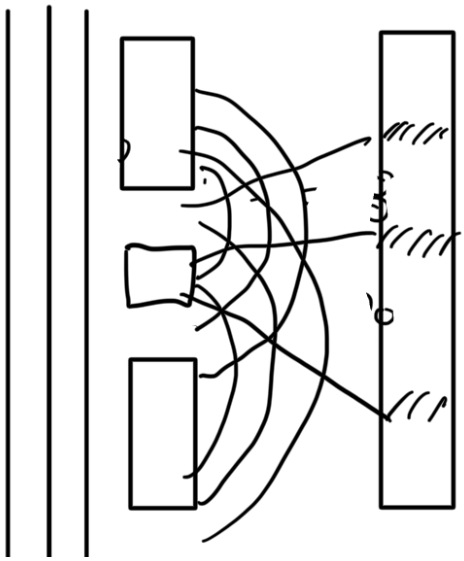
tennis balls



You see two slits

What do you expect to see with waves?

wave front



If wavelength = distance between slits, interference pattern.

| | |

You get constructive interference when
peak + peak

Destructive
peak + trough

## How do electrons behave?

You'd expect tennis balls, but it's actually
waves — most of the time

Put a stream of electrons through two slits
and you get interference patterns

Cover up one slit, and single stream behave
like tennis balls. Re-open 2nd slit and
interference pattern starts to form as electrons
build up.

Explanation?

⇒ electrons interfere with each other.

no: even if only one electron goes through at a time, you get interference pattern.

=> electron splits & recombines.

no: place a detector at slits & interference pattern disappears.

Conclusion:

- electrons sometimes behave like particle & other times like wave.
- if you observe them, behavior changes.