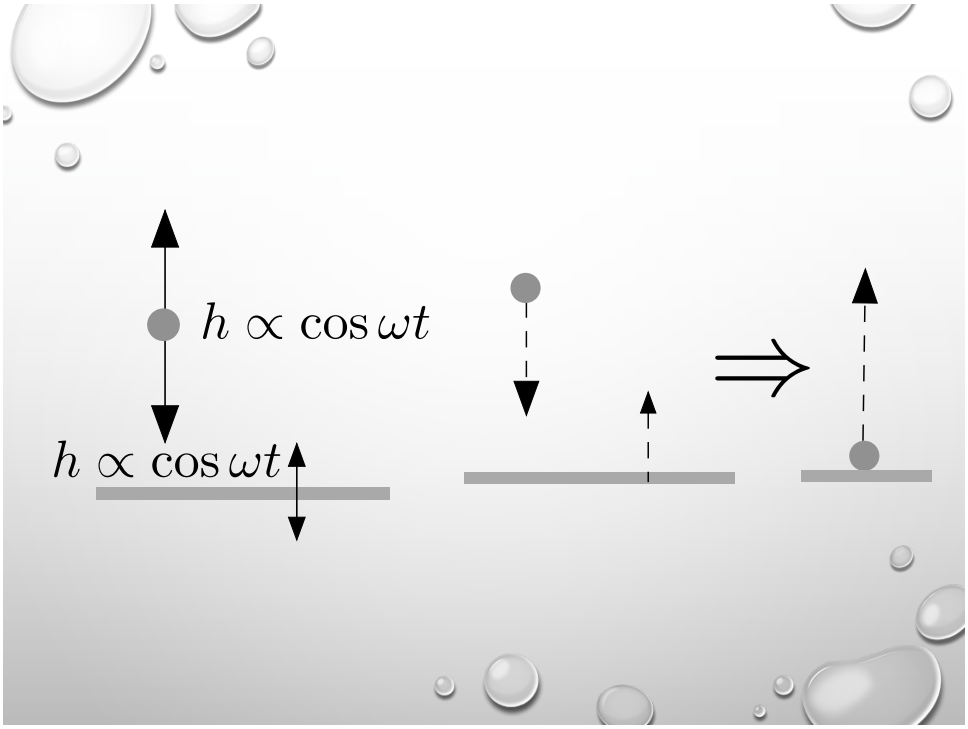
BOUNCING DROPLETS: A NEW MODEL FOR THE QUANTUM WORLD

WHAT IS QUANTUM MECHANICS?

- GOVERNS THE BEHAVIOUR OF SUB-ATOMIC PARTICLES
- PARTICLES CAN BEHAVE LIKE WAVES
- DOUBLE SLIT EXPERIMENT – CONSTRUCTIVE & DESTRUCTIVE INTERFERENCE
- ELECTRON GUN EXPERIMENT – PARTICLES DIFFRACT THROUGH A SINGLE SLIT
- PARTICLES ARE DETERMINED BY THE ACT OF THEIR MEASUREMENT

HOW OUR EXPERIMENT WORKS

- AN AMPLIFIER CAUSES THE LIQUID SURFACE TO VIBRATE
- DROPLETS FALL ONTO THE SURFACE, AND BOUNCE UNDER CERTAIN CONDITIONS



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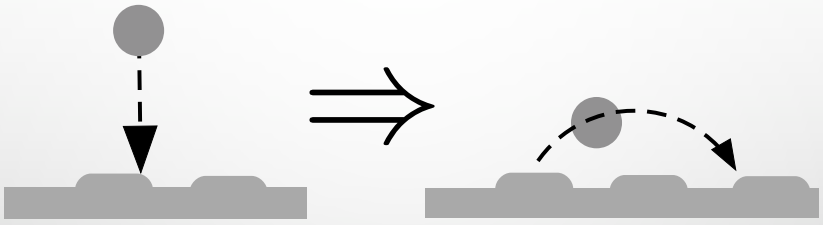

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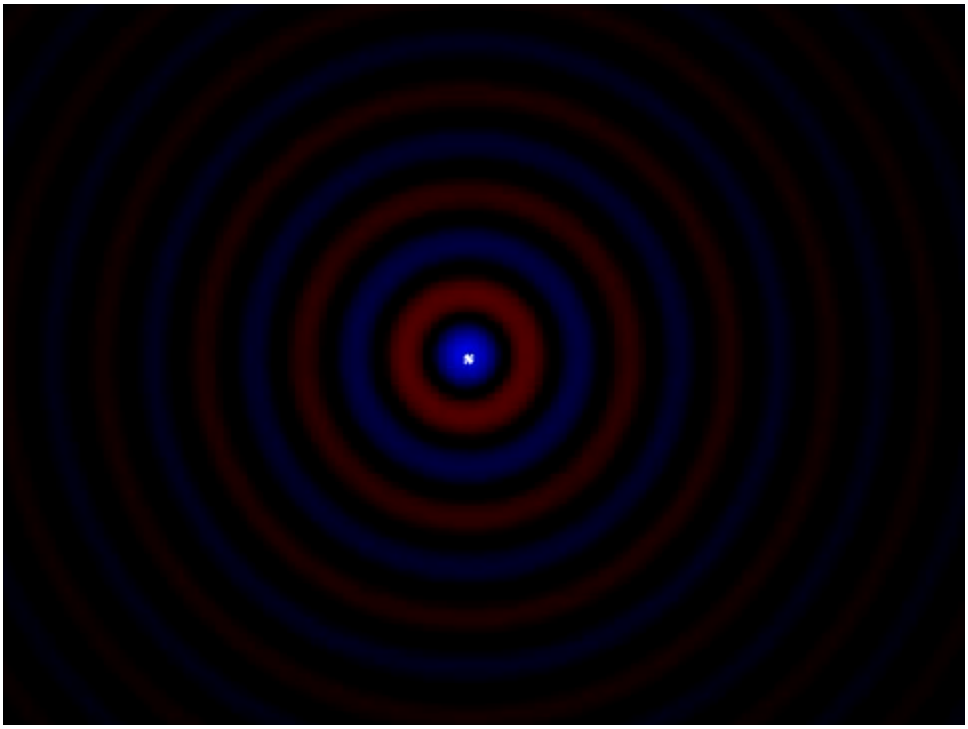

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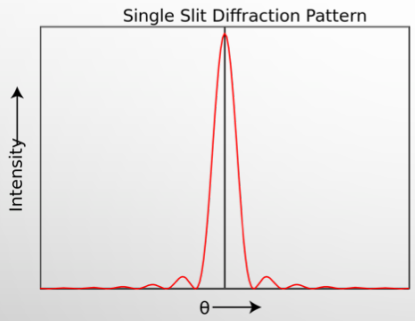
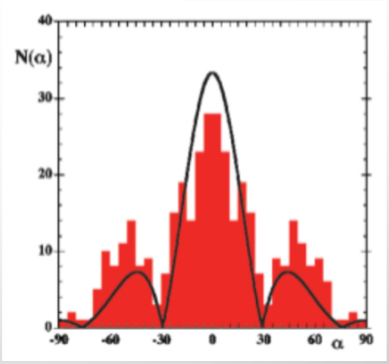
- THE HORIZONTAL DISPLACEMENT IS CHAOTIC, SO WE CANNOT PREDICT THE EXACT PATH OF THE DROPLET

HOW THIS REPRESENTS QUANTUM BEHAVIOUR

- SINGLE SLIT DIFFRACTION – EXPECTED RESULT FROM WAVE THEORY?

SINGLE-SLIT DIFFRACTION





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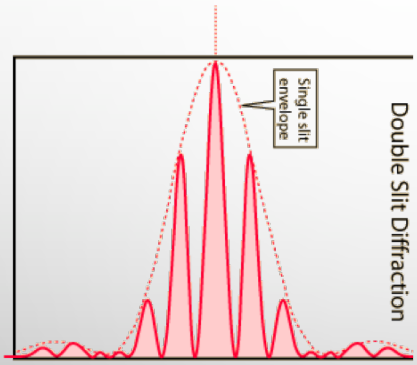
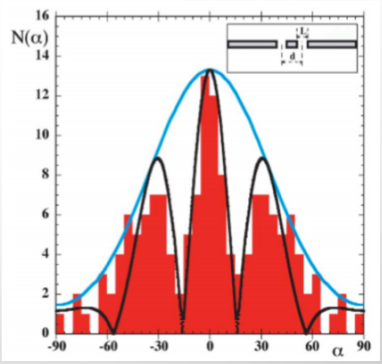
DOUBLE-SLIT DIFFRACTION





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- SINGLE SLIT DIFFRACTION – EXPECTED RESULT FROM WAVE THEORY?
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- A CLASSICAL PARTICLE BEHAVES LIKE A WAVE – JUST LIKE QM PREDICTS!

PHYSICS AT UNIVERSITY: QUESTIONS?