✨ QUANTUM AI ✨

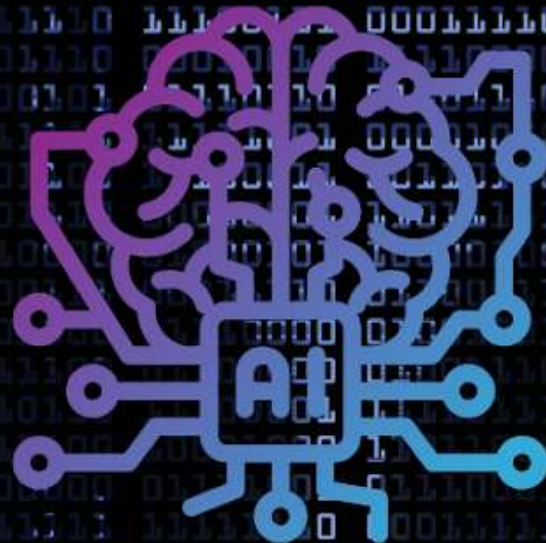# QUANTUM AI IN HEALTHCARE & ALL OTHER DEPTS

BY

SADIK BASHA S (NOVICE)

BIOMEDICAL DEPT-CENTRAL LAB & BLOOD BANK-ALBAHA

"WISDOM IS EARNED THROUGH PERPETUAL DISCOVERY"

Quantum AI

THE INTERSECTION OF QUANTUM COMPUTING
AND ARTIFICIAL INTELLIGENCE

✨ **Why Quantum?** ✨

Some medical calculations take years
Quantum computers do them in minutes

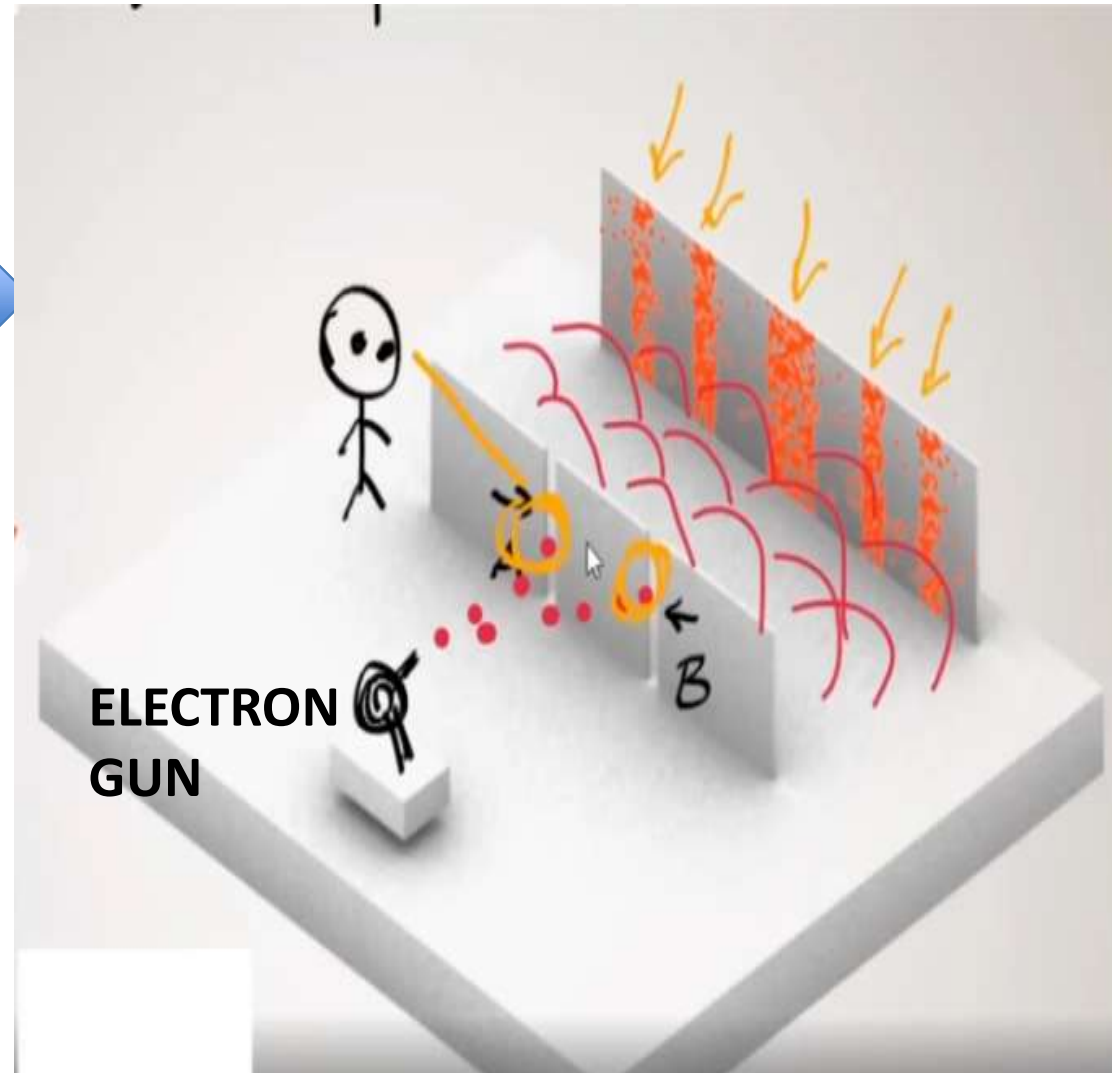Example: DNA decoding, drug testing simulations

QUANTUM PHYSICS

WAVE PARTICLE DUALITY

DOUBLE SLIT EXPERIMENT
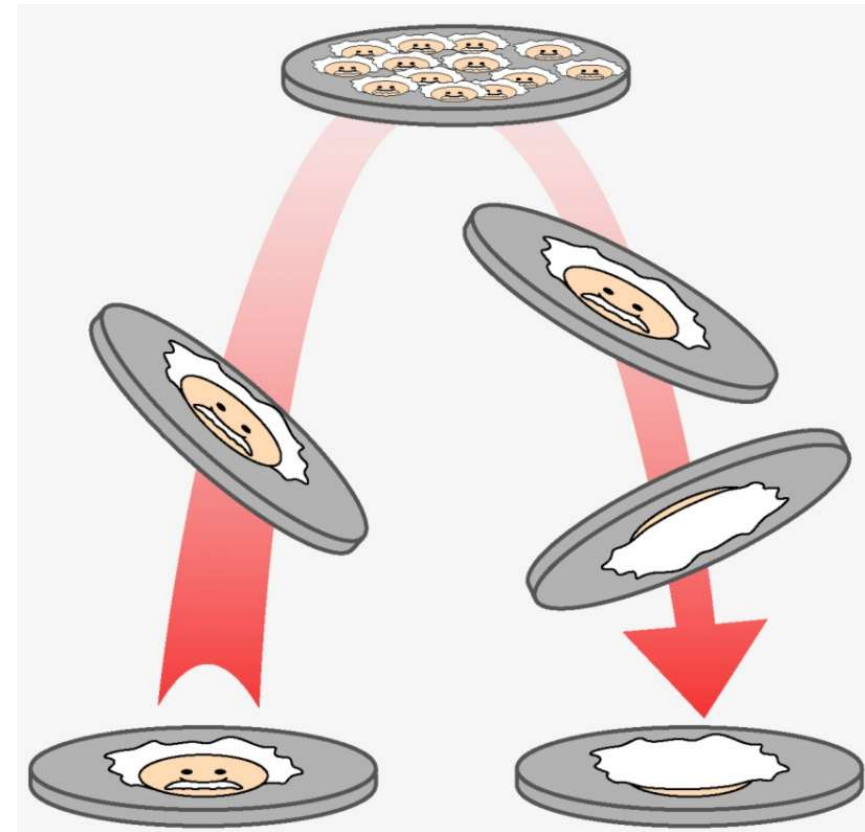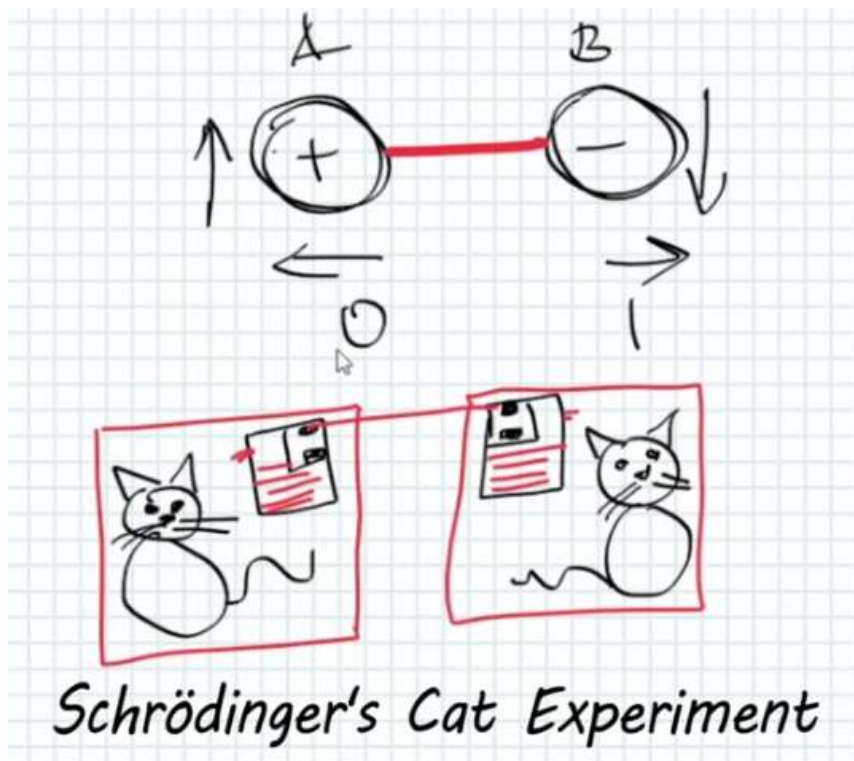
SUPER POSITION

QUANTUM ENTANGLEMENT

QUANTUM COMPUTING

ELECTRON GUN

SUPERPOSITION & ENTANGLEMENT

Quantum Computer = Superposition= QUBITS
Normal Computer = Bits (0,1)
Quantum Entanglement

Schrödinger's Cat Experiment

SUPERPOSITION & ENTANGLEMENT(Cont.d)

Properties of Quantum Behavior – Superposition and Entanglement

This slide represents the superposition and entanglement of quantum behavior. It also shows how qubits can correlate with each other even if they are not physically connected.

Superposition
Unlike classic computers, quantum computers can represent either '0', '1' or both possible states at a time
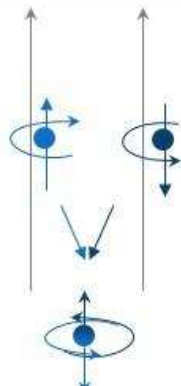
Entanglement
Two qubits can strongly correlate with each other even if they are located light-years apart. In the quantum world, this entanglement is used to encode problems
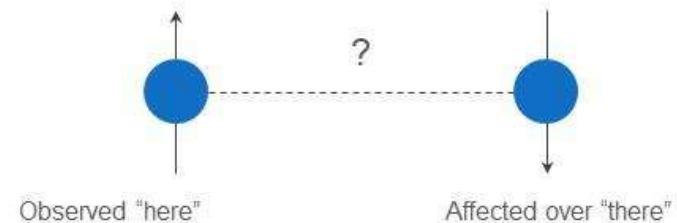
Quantum Properties

Superposition

Existence of different states

Entanglement

?

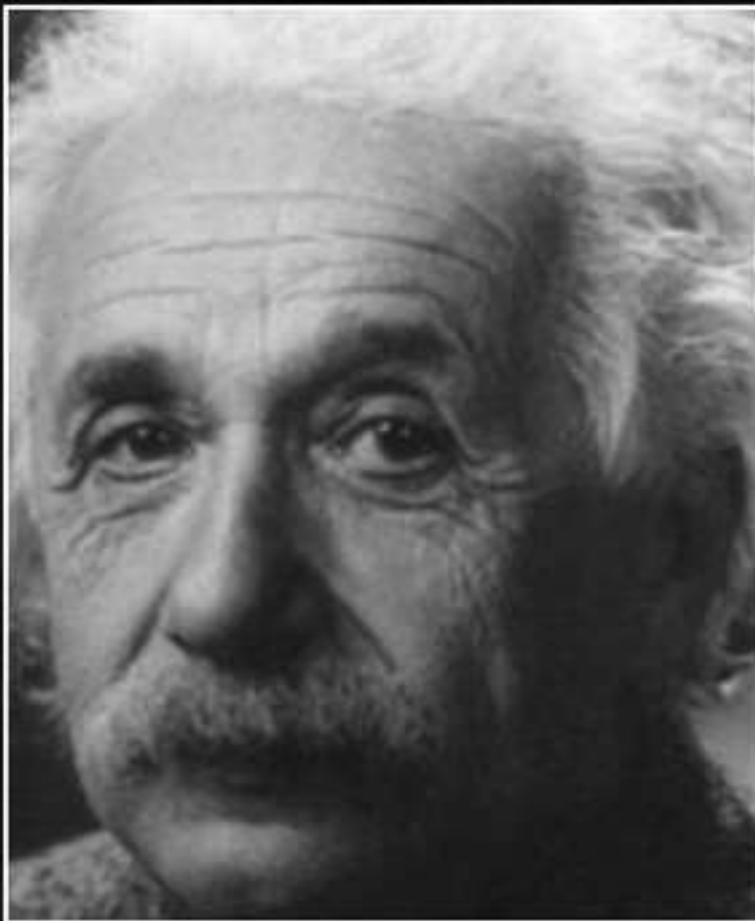Observed "here"   Affected over "there"

Correlation of two qubits

Albert Einstein (E= mc²)
Spooky Action at a Distance

I cannot seriously believe in it [quantum theory] because the theory cannot be reconciled with the idea that physics should represent a reality in time and space, free from spooky actions at a distance [spukhafte Fernwirkungen]
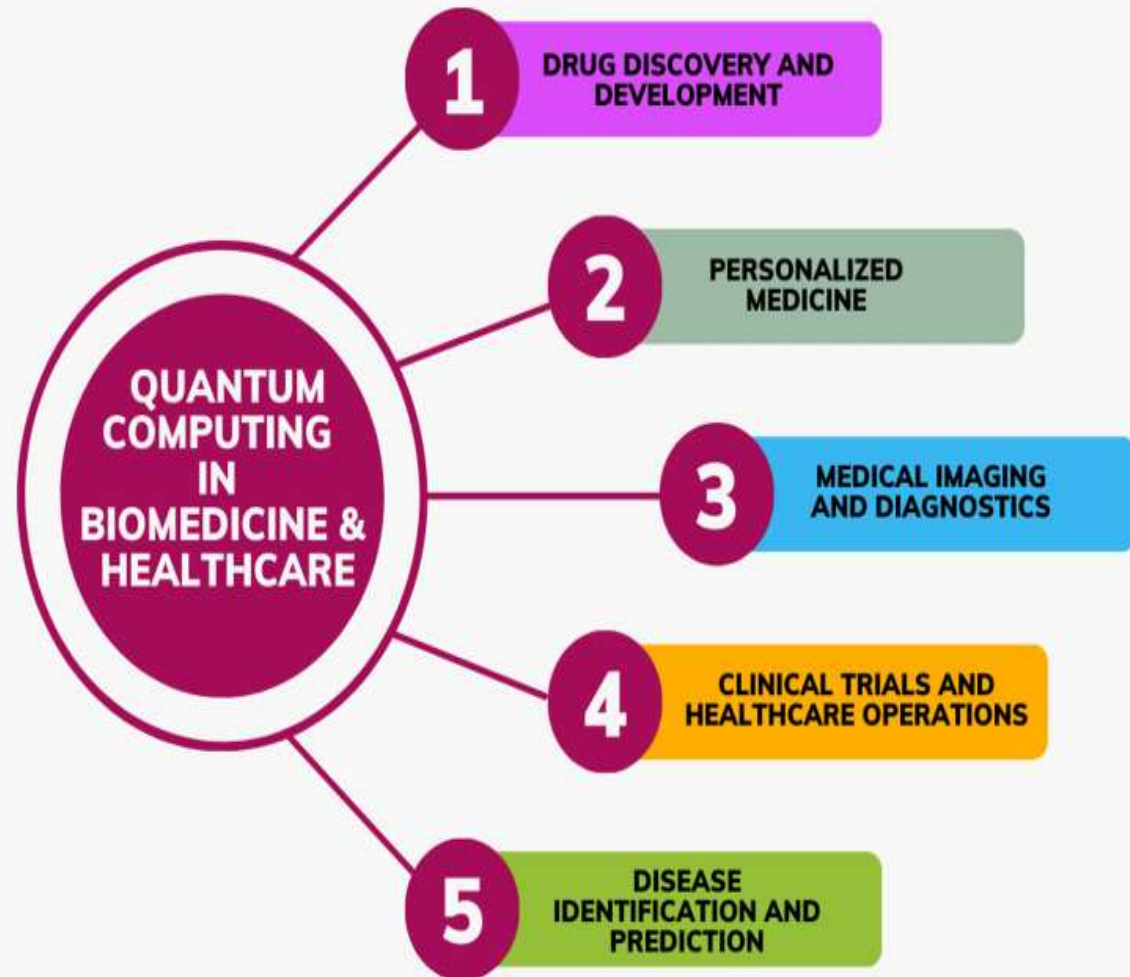
~Albert Einstein

Future of Healthcare

GOOGLE'S SYCAMORE EXPERIMENT IN **2019** SHOWED QUANTUM SUPREMACY, WHERE A QUANTUM COMPUTER SOLVED A PROBLEM IN **200** SECONDS WITH APPROXIMATE **53 QUBITS** THAT MIGHT TAKE CLASSICAL SUPERCOMPUTERS **10,000** YEARS WHICH IS UNDER DEBATE

IBM WILL LAUNCH QUANTUM COMPUTING WITH MORE THAN **1000 QUBITS** IN **2026**

QUANTUM COMPUTING IN BIOMEDICINE & HEALTHCARE

1. DRUG DISCOVERY AND DEVELOPMENT
2. PERSONALIZED MEDICINE
3. MEDICAL IMAGING AND DIAGNOSTICS
4. CLINICAL TRIALS AND HEALTHCARE OPERATIONS
5. DISEASE IDENTIFICATION AND PREDICTION

HOW QUANTUM AI HELPS IN STUDYING MOLECULAR & PROTEIN STRUCTURES

Understanding Complex Molecules

- Molecules and proteins have countless possible shapes and folding patterns.
- Classical computers struggle because the number of possibilities grows **exponentially**.
- **Quantum computers**, with their qubits and entanglement, can **simulate molecular interactions directly** at the quantum level.

Protein Folding & Misfolding

- Proteins fold into 3D shapes that determine how they function in the body.
- Misfolding leads to diseases (e.g., Alzheimer's, Parkinson's).
- **Quantum AI** can analyze huge folding possibilities much faster, helping predict the correct 3D structures.

HOW QUANTUM AI HELPS IN STUDYING MOLECULAR & PROTEIN STRUCTURES..(CONT.D)

Drug Discovery

•Drugs work by binding to proteins.
•Quantum AI can **simulate binding interactions** more accurately than classical models.
•This speeds up finding effective drug candidates and reduces expensive trial-and-error lab work

Precision Healthcare

- With patient-specific genetic/protein data,

- Quantum AI can:

- Model how mutations affect protein shape.

- Suggest personalized treatments.
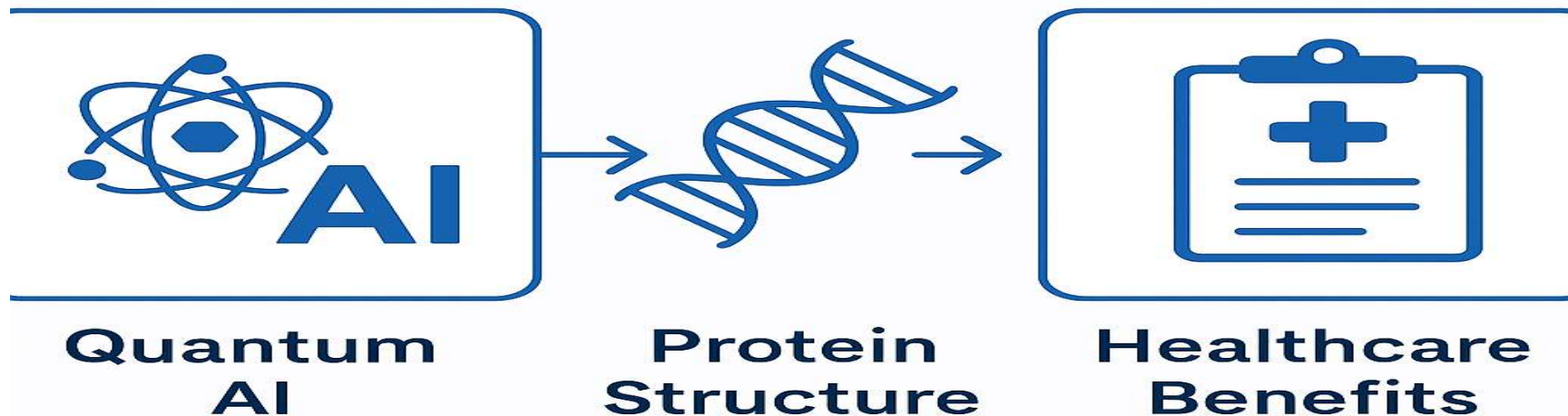
SIMPLE EXAMPLE:

THINK OF A PROTEIN AS A VERY TANGLED ROPE.

A NORMAL COMPUTER TAKES YEARS TO TRY ALL POSSIBLE UNTANGLING MOVES.

QUANTUM AI CAN EXPLORE MANY MOVES AT ONCE → FINDS THE RIGHT FOLD IN HOURS OR DAYS.

- Quantum AI = Superpower for understanding life at the smallest scale → faster drug discovery, better disease prediction, and personalized medicine.

QUANTUM AI FOR STUDYING MOLECULAR AND PROTEIN STRUCTURE IN HEALTHCARE

Quantum AI → Protein Structure → Healthcare Benefits

Concluding by saying that This is Developing with discovery – TELEPORTATION in Communication too

✨ QUANTUM AI IS REAL, NOT SCIENCE FICTION ✨

GOOGLE QUANTUM AI LAB & IBM IS PIONEERING IT SOON: HOSPITALS MAY RUN ON QUANTUM-POWERED AI SOON

INSHA'ALLAH ! IMPLEMENTATION OF QUANTUM AI IN SAUDI ARABIA IN ALL DEPARTMENTS LIKE HEALTHCARE, METEOROLOGY, FINANCE AND OTHER DEPTS WILL ENHANCE AND KEEP SUSTAINABILITY FOR SAUDI VISION 2030.....

9/30/2025

Q&A SESSION

✨ "WITH GRATITUDE FOR THIS OPPORTUNITY, LET US NOW JOURNEY INTO THE FASCINATING WORLD OF QUANTUM AI — WHERE SCIENCE, TECHNOLOGY, AND HEALTHCARE CONVERGE FOR A SMARTER FUTURE."