

EXPLORING THE POTENTIAL OF



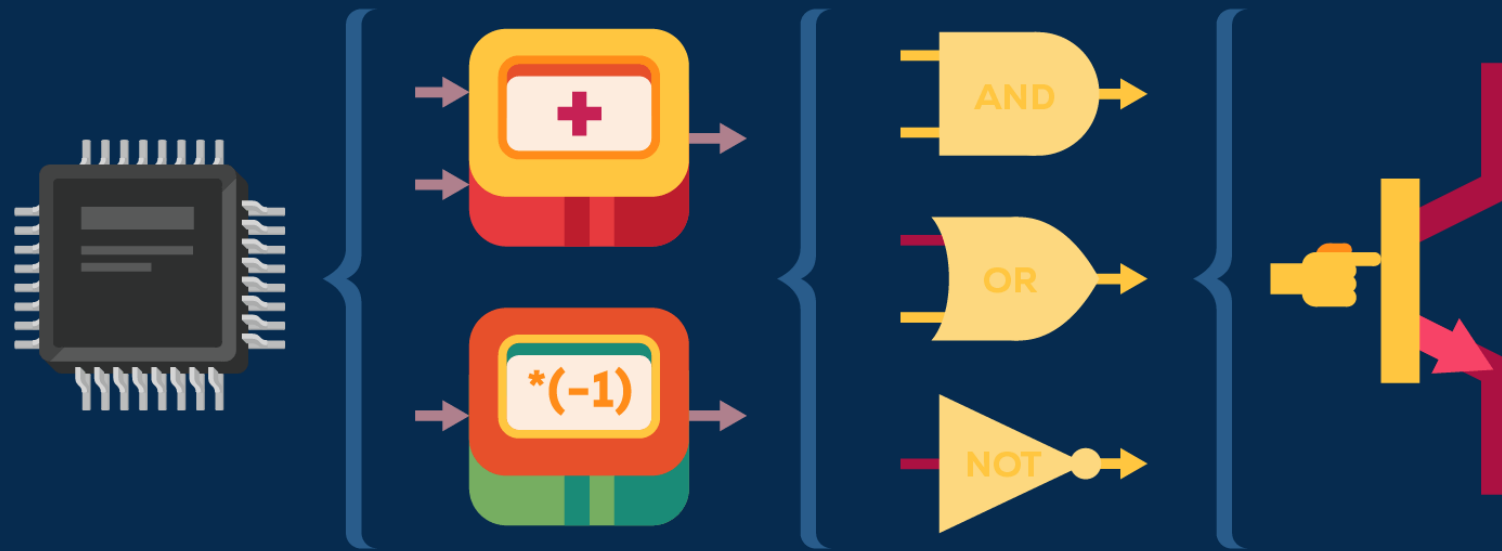
QUANTUM COMPUTING

Ankitha Pilli
160115733122

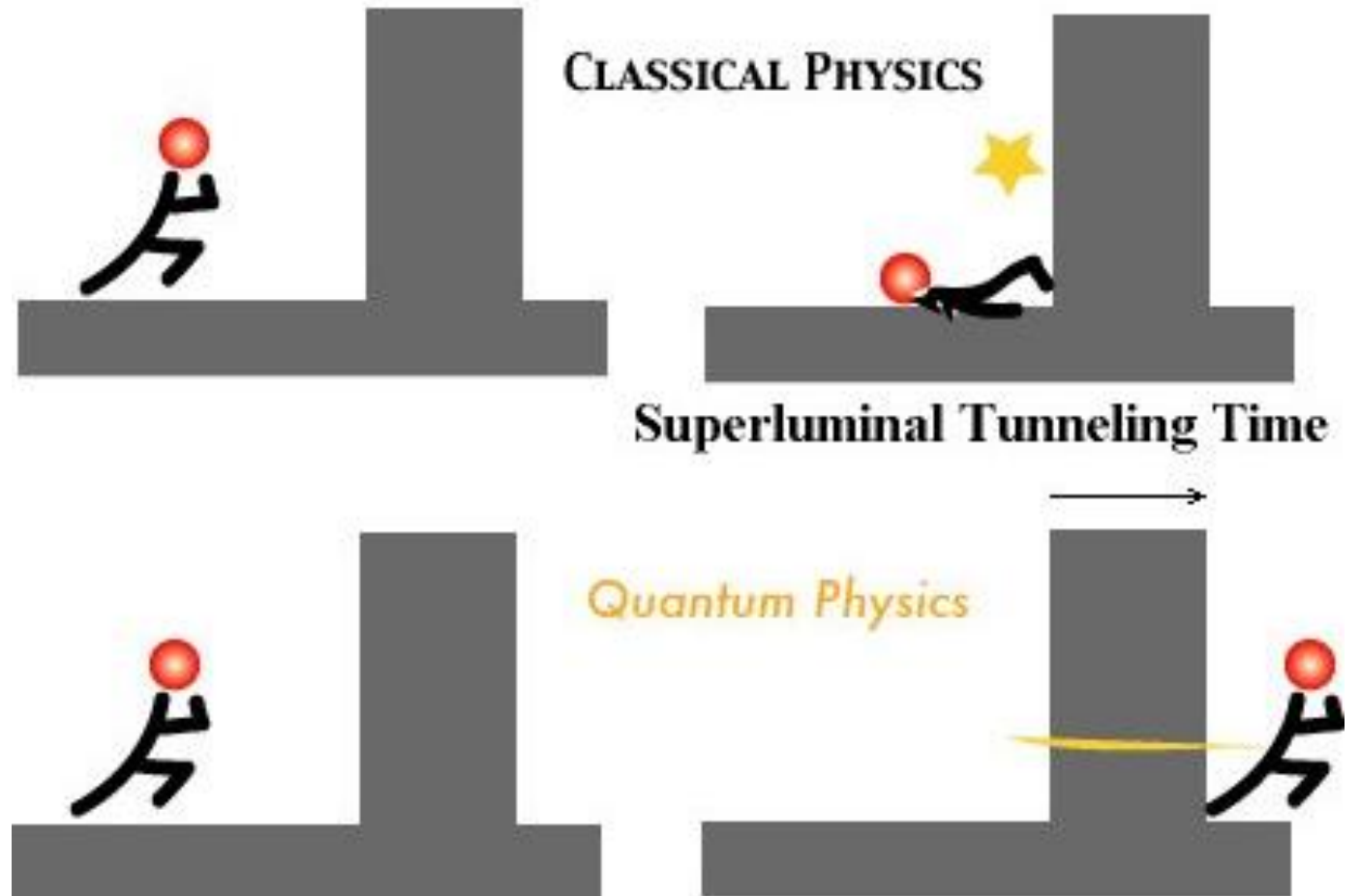
Mentor
Dr. K. Sagar





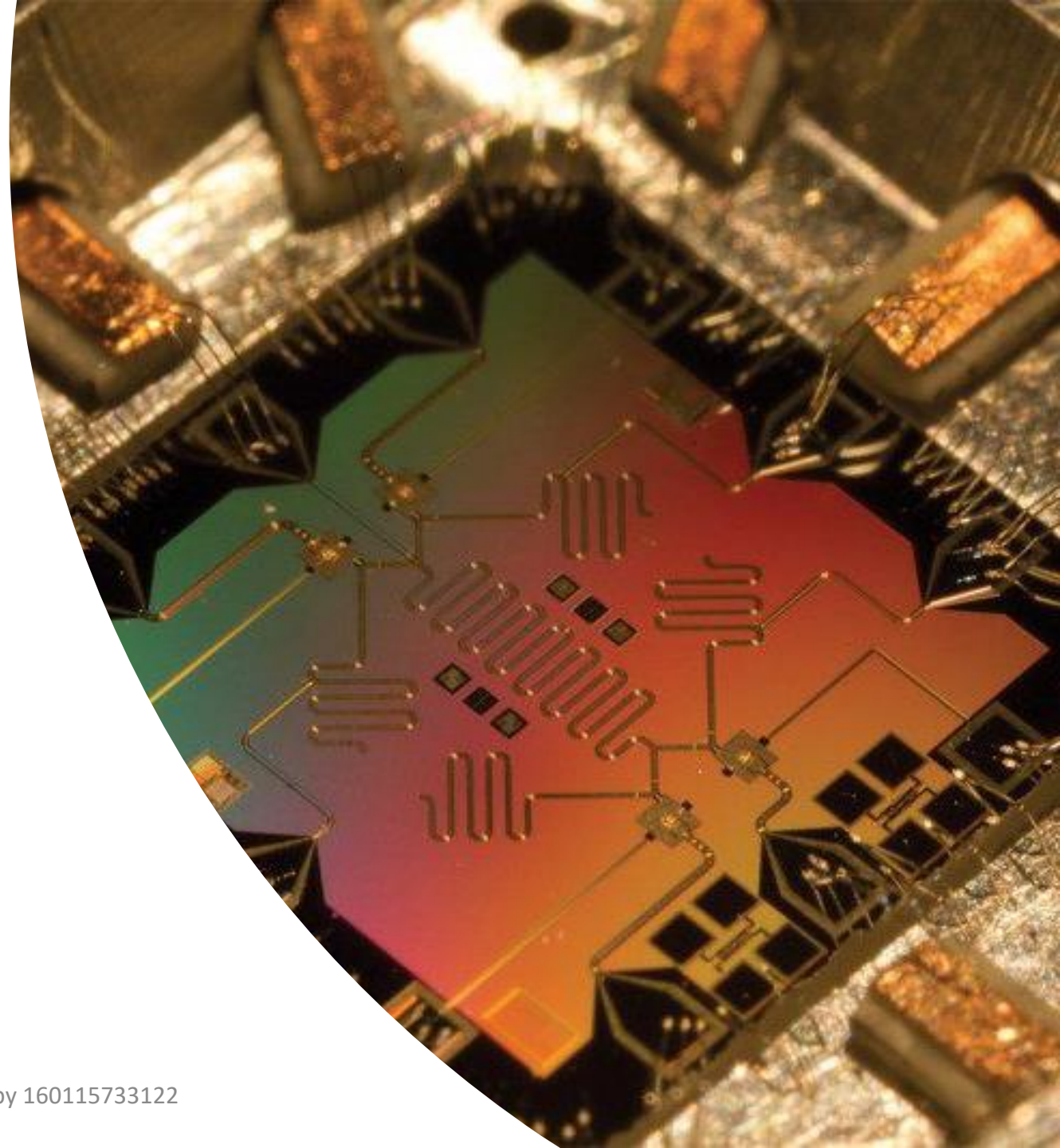


QUANTUM TUNNELING

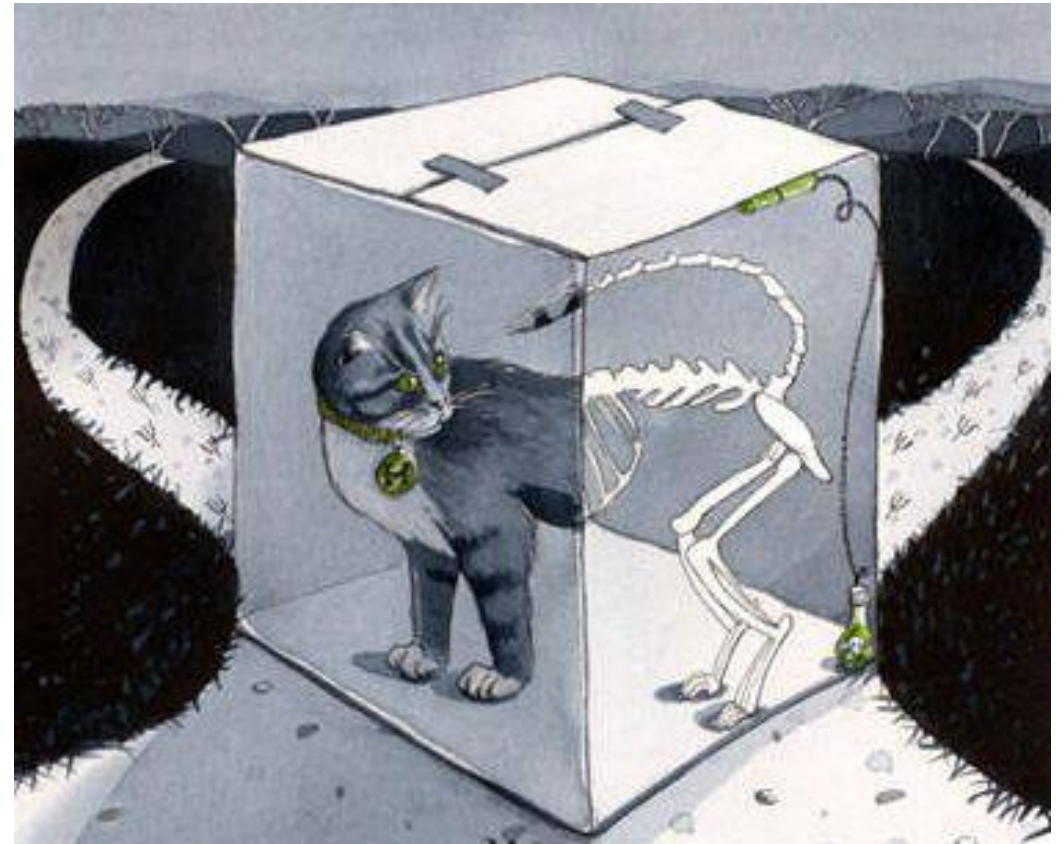


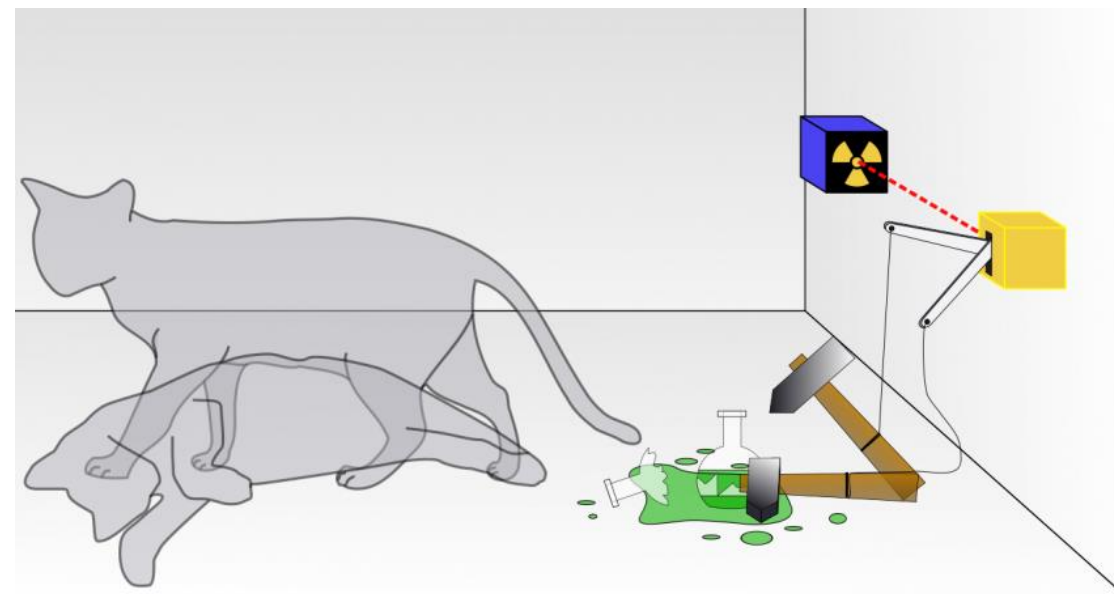
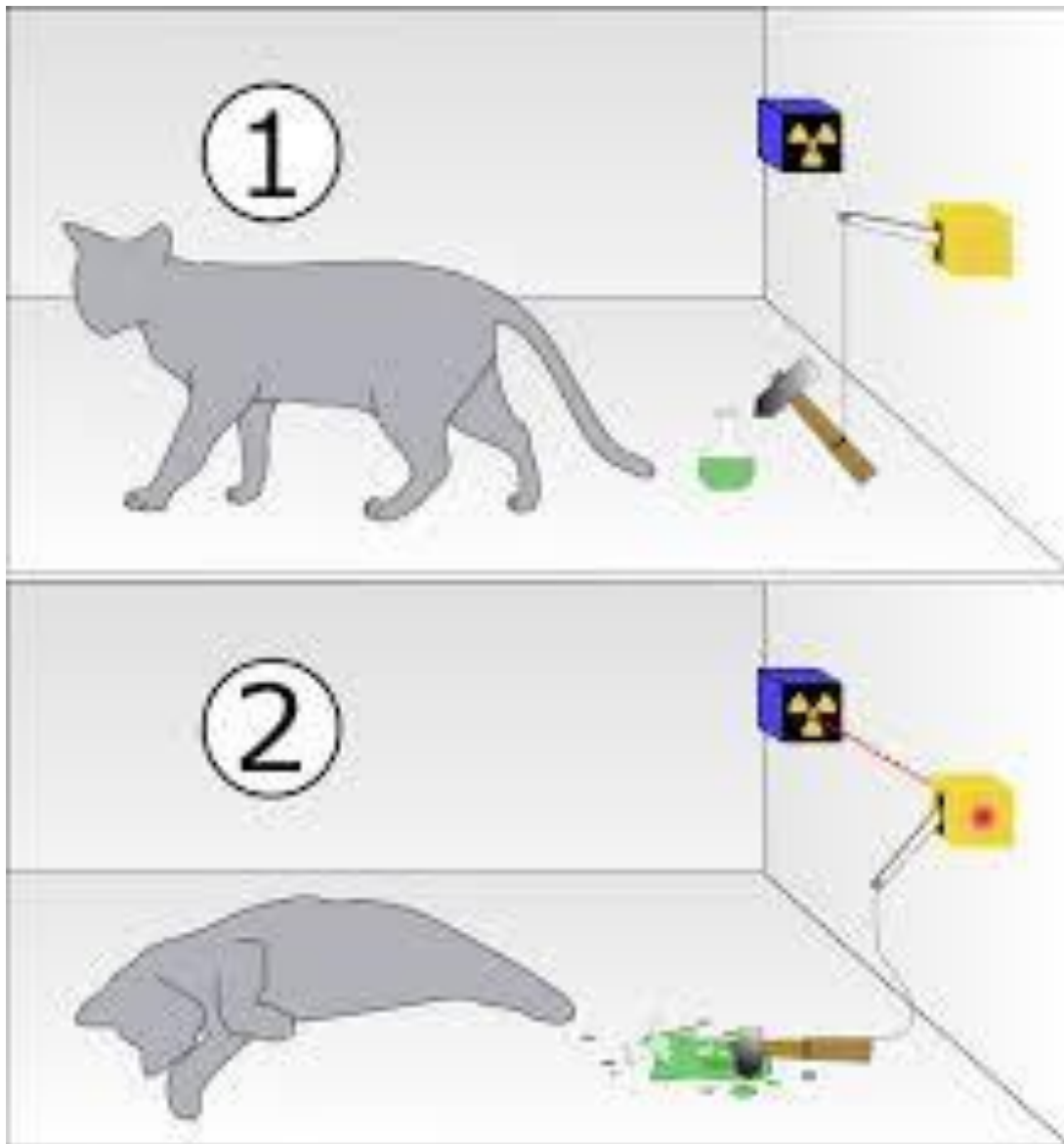
QUBITS

(quantum bits which can be made using a photon, an electron, or a nucleus)



QUANTUM SUPERPOSITION





0 and 1

0 and 1

0 and 1

A	B	C
0	0	0
0	0	1
0	1	0
0	1	1
1	0	0
1	0	1
1	1	0
1	1	1

A	B	C	Score
0	0	0	-1
0	0	1	1 <- one of the best solutions
0	1	0	-1
0	1	1	-1
1	0	0	-1
1	0	1	-1
1	1	0	1 <- the other best solution
1	1	1	-1

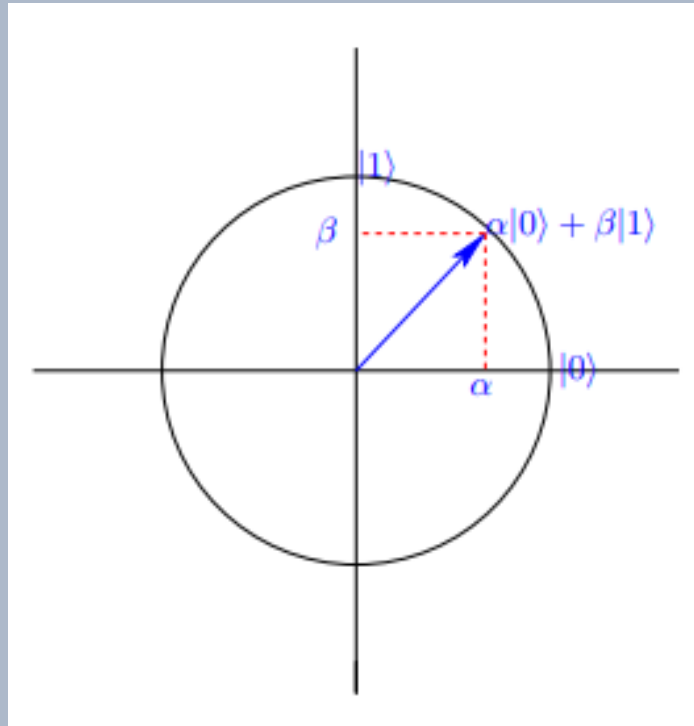
So, if there are 100 people, we'll need to go through:

$2^{100} \approx 10^{30}$ = one million million million million million configuration

A qubit or quantum bit is a quantum system whose state can be fully described by a superposition of two orthonormal eigenstates labeled $|0\rangle$ and $|1\rangle$.

The general state $|\psi\rangle \in \mathcal{H}$ of a qubit is given by

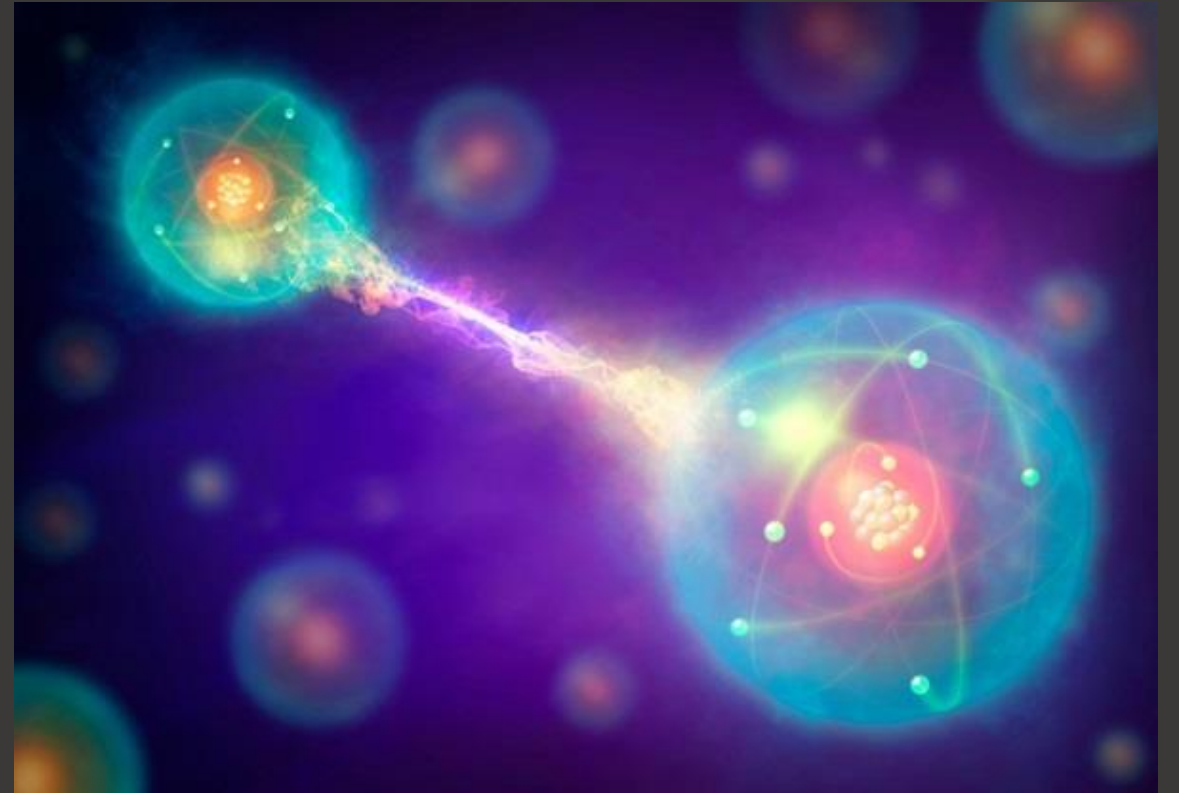
$$|\psi\rangle = \alpha|0\rangle + \beta|1\rangle \quad \text{with} \quad |\alpha|^2 + |\beta|^2 = 1$$



QUANTUM ENTANGLEMENT

spooky action at a distance

Quantum entanglement allows qubits that are separated by incredible distances to interact with each other instantaneously (not limited to the speed of light).

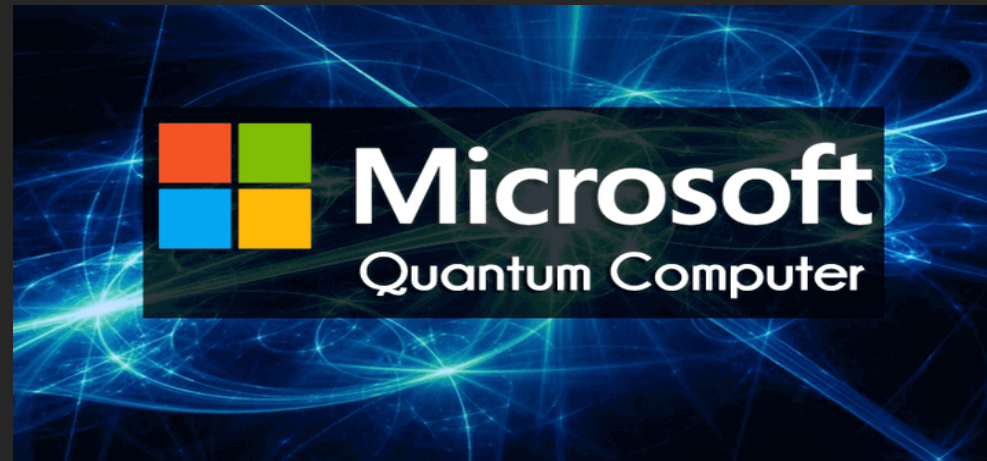


A quantum computer is used to direct a radiation beam that destroys the cancer cells with extreme precision and spares all surrounding tissue*.



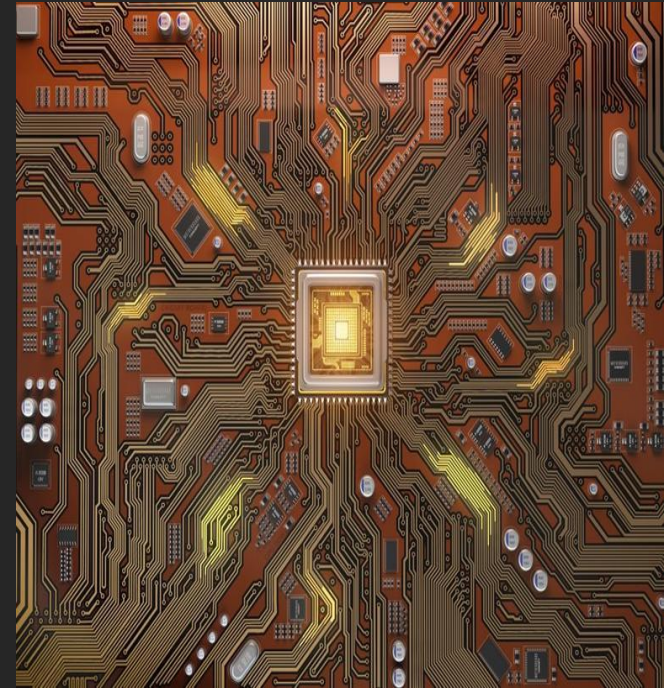
*Solenov, Dmitry et al. "The Potential of Quantum Computing and Machine Learning to Advance Clinical Research and Change the Practice of Medicine" *Missouri medicine* vol. 115,5 (2018): 463-467.

The computational power to generate diagnoses in real time or to increase the precision of imaging to detect early stages of cancer may soon push beyond the limits of the standard binary 0/1 system available to Watson.



Quantum Cryptography

Cryptography is expected to be the first application of quantum computing to enter medical practice to secure medical records and communication.





Can you buy a
quantum
computer?

Can we shift completely?

The image features the word "CONCLUSION" in large, light-colored wooden block letters. The letters are arranged in a single row and are set against a dark, textured wooden background. The lighting is soft, creating a slight shadow beneath the letters, which emphasizes their three-dimensional quality. The overall composition is simple and centered.

CONCLUSION

REFERENCES

- [1] Solenov, Dmitry et al. "The Potential of Quantum Computing and Machine Learning to Advance Clinical Research and Change the Practice of Medicine" *Missouri medicine* vol. 115,5 (2018): 463-467.
- [2] Prathamesh Ratnaparkhi, B. K. Behera, and P. K. Panigrahi, "Getting Started With Quantum Computation: Experiencing The Quantum Experience," *Unpublished*, 2018. doi: 10.13140/RG.2.2.24079.23207
- [3] A. Frisch, "IBM Q — Introduction into quantum computing with live demo," *2017 30th IEEE International System-on-Chip Conference (SOCC)*, Munich, 2017, pp. 1-2. doi: 10.1109/SOCC.2017.8225985

**THANKS
FOR
LISTENING**

ANY
QUESTIONS?

