Google's Quantum Computing Breakthrough

Source: BS

Google has unveiled a **new <u>quantum computer</u>** featuring a chip called **Willow**, capable of performing calculations in **under five minutes** that would take the most advanced <u>supercomputers</u> over **10 septillion years** (a length of time that exceeds the age of the known universe).

- This achievement, described as "<u>quantum supremacy</u>," signifies that Google's quantum computer can perform tasks beyond the reach of traditional computers.
 - However, these tasks, such as generating random numbers, are primarily theoretical and lack immediate practical applications like <u>drug discovery</u>.
- A significant breakthrough includes surpassing the "error correction threshold," an important milestone toward reducing computational errors and enabling practical applications.
- Scientists are now shifting focus toward achieving "<u>quantum advantage</u>," where quantum computers could drive advancements in practical fields like AI, chemistry, and medicine.
- Traditional Computing vs Quantum Computing: Traditional computers process information as "bits," each representing either a 1 or a 0, to perform calculations.
 - In contrast, quantum computers leverage "qubits," which can exist as both 1 and 0 simultaneously, harnessing the principles of quantum mechanics.
 - This unique property **allows qubits to exist in multiple states** at once, enabling exponential increases in computational power.

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