



Inaugural Talk for the International Year of Quantum Science and Technology (IYQ), 2025, at TCG CREST (Kolkata, India)



Speaker

Prof. David Wineland

Physics Nobel Laureate

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Title : *Quantum Computers and Raising Schrödinger's Cat*

Abstract:

Quantum systems such as atoms can be used to store information. For example, we can store a binary bit of information in two energy levels of an atom, labeling the state with lower energy a "0" and the state with higher energy a "1." However, quantum systems can also exist in "superposition states", thereby storing both states of the bit simultaneously, a situation that makes no sense in our ordinary-day experience. This property of quantum bits or "qubits" potentially leads to an exponential increase in memory and processing capacity. It would enable a quantum computer to efficiently solve certain problems such as factorizing large numbers, a capability that could compromise the security of current encryption systems. It could also be used to simulate the action of other important quantum systems in cases where such a simulation would be intractable on a conventional computer. A quantum computer could also realize an analog of "Schrödinger's Cat," a bizarre situation where a cat could be simultaneously dead and alive. Experiments whose goal is to realize a quantum computer based on laser manipulations of atomic ions will be described but this is just one platform that many groups around the world are investigating.

Date & Time : 20th January 2025 @ 9:00 AM IST

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Organized by: CQuERE (Centre for Quantum Engineering, Research and Education), TCG CREST, Kolkata, INDIA

For more details, please visit the website: <http://www.tcgcrest.org/iyq2025>

For any queries, feel free to contact us through the email: iyq.2025@tcgcrest.org