

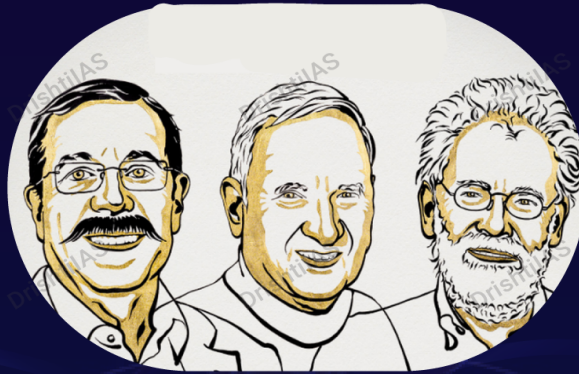


Nobel Prize in Physics 2022

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NOBEL PRIZE IN PHYSICS 2022

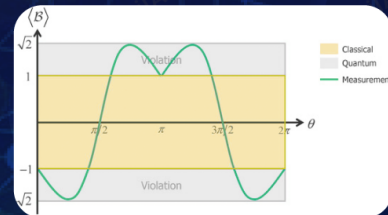


NOBEL LAUREATES JOHN F. CLAUSER, ALAIN ASPECT AND ANTON ZEILINGER

❁ **Field of Research:** Experiments with **entangled photons** (quantum entanglement), established the violation of **Bell inequalities**, and pioneering **quantum information science**.

❁ Key Terms

- ❁ **Quantum Mechanics:** A subfield of physics that describes the behavior of particles - atoms, electrons, photons etc. - in the molecular and sub molecular realm.
- ❁ **Quantum Entanglement:** A phenomenon by which a pair of subatomic particles are allowed to exist in a shared state where they have complementary properties; by measuring the properties of one particle, one can automatically know the properties of the other particle (regardless of how far apart the two particles are transported).
- ❁ **Bell Inequality:** Developed by **John Stewart Bell**, it states that if there are hidden variables, the correlation between the results of a large number of measurements will never exceed a certain value.



Bell Inequality

❁ **Significance:** It will help in constructing **quantum computers**, improving measurements, building **quantum networks**, establishing secure quantum encrypted communication (**quantum cryptography**) and in **precise timekeeping** as is done in atomic clocks.

Indian Nobel Prize Laureates:

- ❁ **Sir Chandrasekhara Venkata (CV) Raman:** Won the Nobel Prize for Physics in **1930** for the discovery of Raman Effect. **Raman Effect** is the phenomenon of change in wavelength in light rays that are deflected. It forms the basis for Raman spectroscopy which is used by chemists and physicists to gain information about materials.
- ❁ **Subramanyan Chandrashekar:** Won the Nobel Prize in Physics **1983** for "his theoretical studies of the physical processes of **importance to the structure and evolution of the stars**". He also determined the upper limit of a white dwarf's mass which is referred to as **Chandrasekhar limit**.

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