



***Nobel Laureate, Dr. Serge Haroche, (Nobel Prize-Physics 2012)***

Serge Haroche was born in 1944 in Casablanca. He graduated from Ecole Normale Supérieure (ENS), receiving his doctorate from Paris VI University in 1971 (thesis advisor: Claude Cohen-Tannoudji). After a post-doctoral visit to Stanford University in the laboratory of Arthur Schawlow (1972-73), he became full professor at Paris VI University in 1975, a position he held until 2001, when he was appointed Professor at Collège de France (in the chair of quantum physics). He has been part time professor at Yale University (1984-1993), member of Institut Universitaire de France (1991-2000) and chairman of the ENS Department of Physics (1994-2000). In September 2012, he has been appointed “Administrateur du Collège de France” (equivalent to President of this institution), a position he held until September 2015. Since then, he is Professor Emeritus at Collège de France.

Serge Haroche’s research has mostly taken place in the laboratory Kastler Brossel at ENS. His main research activities have been in quantum optics and quantum information science. He has made important contributions to Cavity Quantum Electrodynamics (Cavity QED), the domain of quantum optics which studies the behaviour of atoms interacting strongly with the field confined in a high-Q cavity, a box made of highly reflecting mirrors. An atom-photon system isolated from the outside world by metallic walls realizes a very simple experimental model which Serge Haroche has used to test fundamental concepts of quantum physics such as state superposition, entanglement, complementarity and decoherence. Some of these experiments are actual realizations in the laboratory of the “thought experiments” imagined by the founding fathers of quantum mechanics. Serge Haroche’s main achievements in cavity QED include the observation of single atom spontaneous emission enhancement in a cavity (1983), the direct monitoring of the decoherence of mesoscopic superpositions of states (so-called Schrödinger cat states) (1996) and the quantum-non-demolition counting of photons (2007). By manipulating atoms and photons in high-Q cavities, he has also demonstrated elementary steps of quantum information procedures such as the generation of atom-atom and atom-photon entanglement (1997) and the operation of quantum logic gates involving photons and atoms as “quantum bits” (1999).

Serge Haroche has received many prizes and awards, culminating in the 2012 Nobel Prize in physics, shared with David Wineland. He is a member of the French and European Academies of Sciences. He is a Foreign Member of the National Academy of Sciences of the United States, of the American Academy of Arts and Sciences, and of the Brazilian, Colombian, Russian and Moroccan Academies of Sciences. He is Doctor Honoris Causa of the Weizmann Institute and of the Universities of Montreal, Patras, Strathclyde and Bar Ilan.