

# Claude Cohen-Tannoudji

Claude Cohen-Tannoudji (1933-), an alumnus of the Ecole normale supérieure de Paris (ENS), was awarded the 1997 Nobel Prize in Physics with Steven Chu and William D. Phillips, for his research in quantum mechanics, and more specifically for research in methods of laser cooling and trapping atoms.

His main research work was carried out at Laboratoire Kastler-Brossel laboratory (CNRS/ENS). It focused on the interaction between atoms and electromagnetic radiation, from light to radio waves. Since the 1980s, his work was centered on the radiative cooling and trapping of atoms.

Localized by facing laser beams, atoms are slowed down in their movement and held in levitation by elementary mechanical forces. Like an object hit by a projectile, an atom that absorbs a photon recoils from the impact. The resulting braking action has given rise to the term “optical molasses” for atoms trapped in a few cubic millimeters. They are cooled by a reduction in the natural thermal agitation that characterizes gas temperatures.

The temperature reached can be a millionth, or even a billionth, of a degree Celsius. It is so low that the free fall of atoms in terrestrial gravity becomes dominant.

The team led by Claude Cohen-Tannoudji has pioneered many experiments of interest to for atom optics, in close analogy to those performed with light, but in which matter waves (associated with atoms) replace light waves (associated with photons).

One further highlight in Claude Cohen-Tannoudji's career is his role in physics education. Several of his books have become classics of quantum physics. He was appointed in 1973 professor at Collège de France and holder of holding the chair of atomic and molecular physics. He is member of the Academy of Sciences.

Together with his wife Jacqueline, a high school physics teacher, he was a great supporter of initiatives to interest young people in science, and physics in particular, such as the national and international Olympiads.