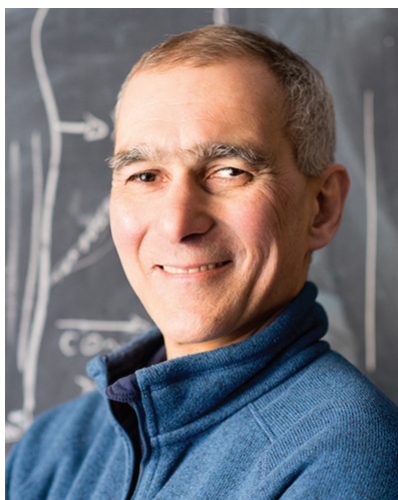


THE NOBEL PRIZE IN CHEMISTRY 2023



Mounqi G. Bawendi

Born: 1961, Paris, France

Affiliation at the time of the award: Massachusetts Institute of Technology (MIT), Cambridge, MA, USA



Louis E. Brus

Born: 1943, Cleveland, OH, USA

Affiliation at the time of the award: Columbia University, New York, NY, USA



Alexei I. Ekimov

Born: 1945, Former USSR

Affiliation at the time of the award: Nanocrystals Technology Inc., New York, NY, USA

The Nobel Prize in Chemistry 2023 was awarded jointly to **Mounqi G. Bawendi**, **Louis E. Brus** and **Alexei I. Ekimov** for the discovery and synthesis of quantum dots.

These smallest components of nanotechnology now spread their light from televisions and LED lamps, and can also guide surgeons when they remove tumor tissue, among many other things. Everyone who studies chemistry learns that an element's properties are governed by how many electrons it has. However, when matter shrinks to nanodimensions quantum phenomena arise; these are governed by the size of the matter. The Nobel Laureates in Chemistry 2023 have succeeded in producing particles so small that their properties are determined by quantum phenomena. The particles, which are called quantum dots, are now of great importance in nanotechnology.

Physicists had long known that in theory size-dependent quantum effects could arise in nanoparticles, but at that time it was almost impossible to sculpt in nanodimensions. However, in the early

1980s, Alexei Ekimov succeeded in creating size-dependent quantum effects in colored glass. The color came from nanoparticles of copper chloride and Ekimov demonstrated that the particle size affected the color of the glass via quantum effects. A few years later, Louis Brus was the first scientist in the world to prove size-dependent quantum effects in particles floating freely in a fluid. In 1993, Mounqi Bawendi revolutionized the chemical production of quantum dots, resulting in almost perfect particles. This high quality was necessary for them to be utilized in applications. Quantum dots now illuminate computer monitors and television screens based on QLED technology. They also add nuance to the light of some LED lamps, and biochemists and doctors use them to map biological tissue. Quantum dots are thus bringing the greatest benefit to humankind. Researchers believe that in the future they could contribute to flexible electronics, tiny sensors, thinner solar cells and encrypted quantum communication – so we have just started exploring the potential of these tiny particles.

<https://www.nobelprize.org/all-nobel-prizes-2023/>