2025 John Howard Appleton Lecture

BROWN
Department of Chemistry

Welcomes

2023 Nobel Chemistry Prize Co-laureate

Moungi Bawendi

Lester Wolfe Professor of Chemistry, MIT

presents

Quantum Dots:

From Curiosity to Technological Impact

Join us

April 3, 2025
4:00 pm

MacMillan Hall 117
167 Thayer St.
Providence RI

Quantum Dots: From Curiosity to Technological Impact

The combination of quantum effects, nanometer dimensions, and a chemical synthesis make quantum dots a platform for exploring new size dependent fundamental properties as well as a sandbox for developing new applications. This talk will cover the origin story of chemically synthesized quantum dots, their basic physics, the synthesis that unlocked their widespread study and applications, an overview of their properties, and a few of their applications, including in bio-imaging and as emissive materials in displays."

Moungi Bawendi
Lester Wolfe Professor of Chemistry
MIT Department of Chemistry

Professor Moungi Bawendi received his A.B. in 1982 from Harvard University and his Ph.D. in 1988 from The University of Chicago. This was followed by two years of postdoctoral research at Bell Laboratories, working with Louis Brus, where he began his studies on nanomaterials. Bawendi joined the faculty at MIT in 1990, becoming Associate Professor in 1995 and Professor in 1996.

Professor Bawendi was one of the initial developers of the field of colloidal quantum dots. He has followed an interdisciplinary research program that has probed the science and technology of chemically synthesized nanostructures. His work has advanced both the fundamental studies of nanomaterials as well as their applications. His laboratory has demonstrated applications of nanomaterials for light emission, photodetection, spectral sensing, solar energy harvesting, and bio-imaging. His group has pioneered novel tools for the spectroscopy of single nanostructures as well as for in-vivo imaging.

Professor Bawendi's studies have included: (1) the development of methods for synthesizing, characterizing, and processing quantum dots, magnetic nanoparticles, and J-aggregates, (2) the study of the fundamental optical and magnetic properties of nanostructures using a variety of spectroscopic methods, including the development of photon correlation tools to study single nanoscopic emitters, (3) incorporating quantum dots, magnetic particles, J-aggregates, and thin film materials into optical and opto-electronic device structures, and (4) developing optical tools and probes, including nanoparticles and other imaging agents, for biomedical imaging.

Professor Bawendi is a fellow of the American Association for the Advancement of Science, a fellow of the American Academy of Arts and Sciences, and a member of the US National Academy of Sciences.

Professor Bawendi is a co-laureate of the 2023 Nobel Prize in Chemistry.