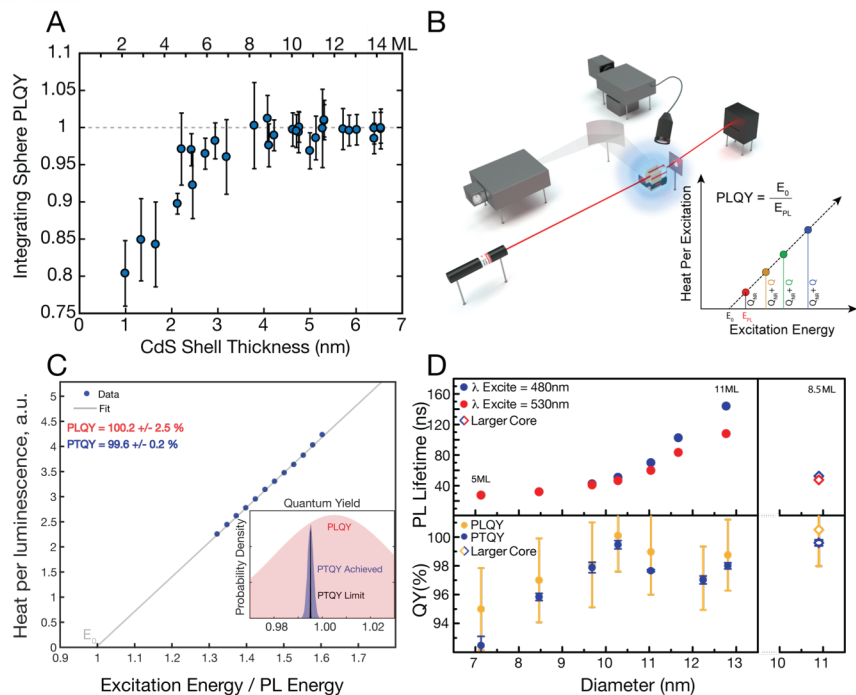


Submitted **Redefining Near-Unity Luminescence in Quantum Dots with Photothermal Threshold Quantum Yield** April 2019



(A) Characterization of highly emissive CdSe/CdS shell series as quantum dots approach unity.
(B) Measurement scheme for the photothermal threshold quantum yield (PTQY) technique
(C) Measured PTQY of 99.6±0.2%
(D) (top) PL lifetimes of CdSe/CdS core and shell excited lifetimes and (bottom) respective PLQY and PTQY of the same near unity plotted against particle Feret diameter.

Salleo, A.; Alivisatos, A. P., Redefining near-unity luminescence in quantum dots with photothermal threshold quantum yield. *Science* **2019**, *363* (6432), 1199.

Scientific Achievement

Berkeley and Stanford researchers develop a more precise quantum yield spectrometer to measure the world's brightest luminescent semiconductors.

Significance and Impact

CdSe/CdS quantum dots synthesized and accurately measured with external luminescent efficiencies that exceed 99.5%

Research Details

- Developed transformative characterization technique that utilizes a heat out/ light out approach to gain 100x precision (1ppt) in measuring luminescent efficiency.
- Designed and synthesized state-of-the-art CdSe/CdS quantum dots that in thin film have the world's brightest confirmed external PLQY.

Work was performed at UC Berkeley & Stanford