

## Special Issue

# Colloidal Quantum Dots: Synthesis, Physics and Applications

### Message from the Guest Editors

Colloidal quantum dots represent a promising class of solution processible semiconductors with a wide range of applications ranging from light harvesting and light emission to lasing and photocatalysis. The choices of the semiconductor core, sizes, defects, ligands that bind to the surface, and the arrangements in thin film devices allow quantum dots properties to be highly tunable. Quantum dots have also found commercial success in display technology, spurring further research into improving their synthesis and manufacturing processes. More recently, efforts have focused on reducing toxicity in these materials, such as using lead-free and cadmium-free alternatives. Additional functionalities have been endowed onto quantum dots—for example, through the doping of the semiconductor core with magnetic elements or chiral ligands for application in spintronics. These experimental advances have also been accompanied by our increased understanding of the underlying physical processes, such as exciton transport, self-trapped exciton, and defect physics.

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### Editor-in-Chief

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