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Quantum dots deposition in a capillary tube YONG LIN KONG, FRANCOIS BOULOGNE, HYOUNGSOO KIM, JANINE NUNES, JIE FENG, HOWARD STONE, Princeton University — The ability to assemble nanomaterials, such as quantum dots, enables the creation of functional devices that present unique optical and electronic properties. For instance, light-emitting diodes with exceptional color purity can be printed via the evaporative-driven assembly of quantum dots. Nevertheless, current studies of the colloidal deposition of quantum dots have been limited to the surfaces of a planar substrate. Here, we investigate the evaporation-driven assembly of quantum dots inside a confined cylindrical geometry. Specifically, we observe distinct deposition or coating patterns of quantum dots at different positions along the length of a capillary tube. Such changes of coating behavior could be influenced by the evaporation speed as well as the concentration of quantum dots. Understanding the factors governing the coating process can provide a means to control the assembly of quantum dots inside a capillary tube, ultimately enabling the creation of novel photonic devices.

Yong Lin Kong
Princeton University

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