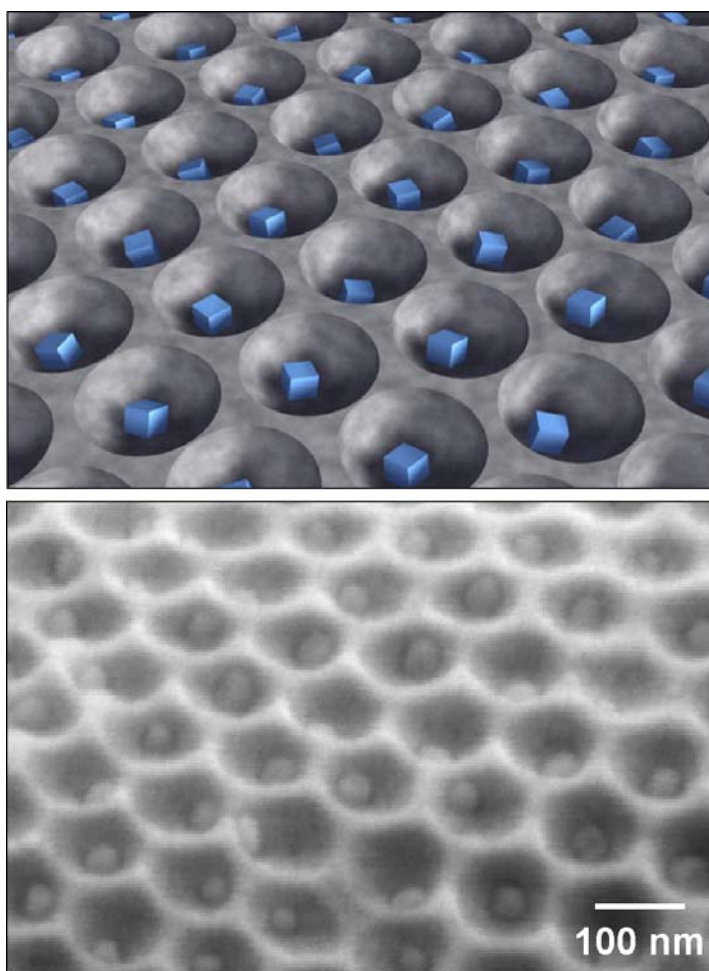


4.1.5 NANOCRYSTAL GROWTH IN NANOSCALE WELLS

J. E. Barton, T. W. Odom, "Mass-Limited Growth in Zeptoliter Beakers: A General Approach for the Synthesis of Nanocrystals," *Nano Lett.*, **2004**, *4*, 1525-1528.

Nanoscale patterning methods provide a unique approach to synthesize nanoscale materials. In this work, NU-NSEC researchers used laser-assisted embossing to generate close-packed arrays of hemispherical nanowells with zeptoliter volumes. The volumes of the nanowells were controlled by changing the fluence of the laser, by applying variable pressure between the mold and the substrate, and by growing an amorphous oxide on the patterned silicon. Nanowells with diameters as small as 50 nm were used as reaction vessels for the preparation of different sizes of simple inorganic salts and semiconducting nanocrystals. Individual nanocrystals were formed in individual nanowells. Many of these particles are precursors to powerful diagnostic probes used in medical disease screening applications.



Rendered and SEM images of NaCl nanocrystals grown in zeptoliter-beakers made by laser-assisted embossing.