ZERNIKE INSTITUTE COLLOQUIUM

Thursday, March 4th, 2009

16:00h, Lecture Hall: 5111.0080 **Coffee and cakes from 15:30h**

Self organization of inorganic nanocrystals in 2D and 3D superlattices: emergence of a new physics

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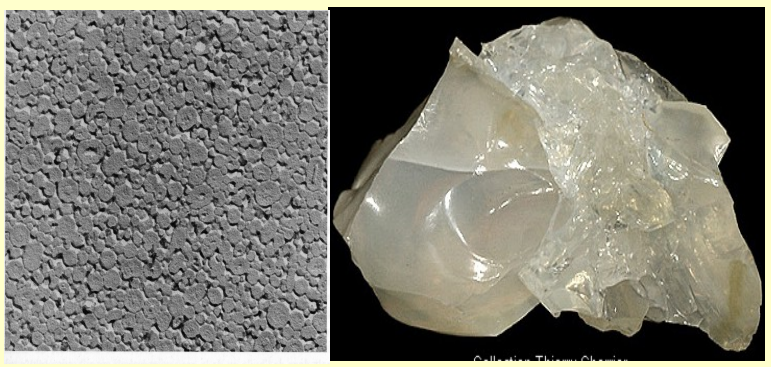
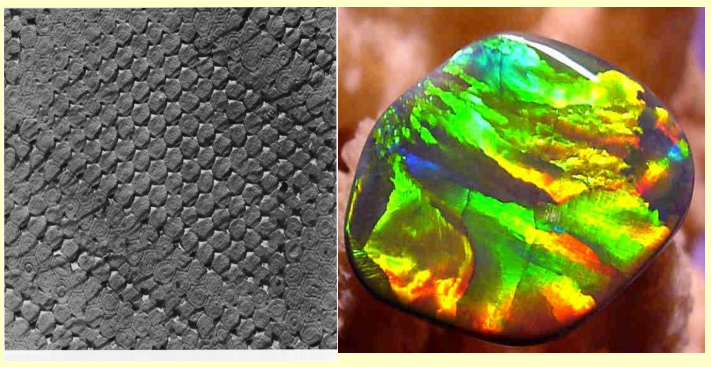
In this presentation we will show that nanomaterials are old as the world. It will be demonstrated that self-assembly of organic molecules can be used as a universal nanoreactor. Hence, reverse micelles (water in oil droplets stabilized by surfactant molecules) can be used either the make inorganic nanomaterials or to chemically modify enzymes with no change in their activities. Other ways in making inorganic nanomaterials will be presented. These nanocrystals can be self-organized in either hexagonal network (2D) or in supracrystals (3D superlattices).

3D desordered aggregate



opale

3D Highly ordered crystal



It will be demonstrated that some chemical properties of inorganic nanocrystals ordered in 2D hexagonal network markedly differ from those expected. It is also demonstrated that crystal growth mechanism markedly differs from what is already established. Nanocrystals self ordered in 3D superlattices are able to breath coherently as atoms in a nanocrystals. Finally it is demonstrated that cracks of nanocrystals film follow a universal scaling law.

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