Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

Pattern formation by liquid crystal of colloidal gold nanorods KYOUNGWEON PARK, School of Polymer, Textile and Fiber Engineering,Georgia Institute of Technology, MOHAN SRINIVASARAO, School of Polymer, Textile and Fiber Engineering and School of Chemistry and Biochemistry — To utilize the properties of nanoparticles to make nanoscale devices, large-scale spatial organization of NRs is required. Colloidal NRs can self assemble to form lyotropic liquid crystals(LC). The formation of lyotropic liquid crystals is a unique way to assemble NRs in solution since metal NR liquid crystals can combine the properties of liquid crystals with the electronic properties of metal component. We observed LC phase of gold NRs by resorting to an evaporating aqueous NR solution. The convective flow caused by the solvent evaporation carries the NRs from the bulk solution to solid-liquid-air interface, which makes the solution locally very concentrated, and therefore phase transition of NRs occured. By changing the aspect ratio, concentration and polydispersity of NR, and evaporation rate, we observed various pattern formation by LC phase similar to Liesegang ring.

Mohan Srinivasarao
Georgia Institute of Technology

Date submitted: 01 Dec 2004 Electronic form version 1.4