Nanostructures Fabricated by Glancing Angle Deposition and Their Novel Applications

Yiping Zhao

Department of Physics and Astronomy
Nanoscale Science and Engineering Center
University of Georgia, Athens, Georgia 30602

Abstract
Glancing Angle Deposition (GLAD) is a simple nanofabrication technique that combines oblique angle deposition (OAD) with substrate manipulations and source controls in a physical vapor deposition system. The geometry shadowing effect is the dominant growth mechanism resulting in the formation of various nanostructure arrays by programming the substrate rotation in polar and/or azimuthal direction. With recent advance in a multilayer deposition procedure, one can design complex and multifunctional heterogeneous nanostructures. In addition, with a co-deposition system of two or more sources, novel nanocomposites or doped nanostructure arrays can be produced, which results in nanostructures with different morphology. In this talk, I will highlight our recent progress in multi-component nanorod array fabrication. We find that the multicomponent nanorods can be used as a high sensitive virus and bacteria sensor based on florescence enhancement. Using a unique multilayer deposition configuration, catalytically driven nanomotors have also been fabricated and demonstrated, which can directly convert chemical energy into mechanical energy. This device holds a great promising to mimic biological motors.