Generating novel inorganic nanostructures by highly concentrated solar and lamp light

By
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Venue: Hilbert Space
Host: Assoc Prof Sum Tze Chien

Abstract

The prediction and experimental realization of inorganic nanotubes and fullerene-like nanostructures engendered new directions in advanced materials. A pivotal challenge is inventing practical, high-yield procedures for producing them - methods that typically require high temperatures, intensely non-equilibrium reactor conditions, and high photonic flux.

This seminar will review the development and demonstration of new optical methods for generating novel inorganic nanostructures, by highly concentrated solar and lamp light. Successful case studies subsume: cage-like nanostructures of Cs2O, fullerene-like and nanotube MoS2, MoSe2, WS2, WSe2, nanowires and nanospheres of SiO2 generated for the first time from pure quartz, nanorods of pure Si, and SiC nanowires. Some of the MoS2 products achieve fundamentally minimum sizes predicted by molecular structural theory, as well as unique hybrid semiconductor-metal nanostructures.

Short Biography

Prof. Jeffrey Gordon hails from the Department of Solar Energy and Environmental Physics, at Ben-Gurion University's Blaustein Institutes for Desert Research in Israel. His research and teaching focus on advanced optical design, the solar energy sciences, photovoltaic physics, novel nanomaterial syntheses, and ultra-high algal bioproductivity. He earned his BA and MA degrees from Columbia University, his PhD from Brown University, and was a post-doc at the Weizmann Institute of Science. He has been a faculty member at BGU since 1978.