UNIVERSITY OF DELAWARE
ENGINEERING
DEPARTMENT OF CHEMICAL & BIOMOLECULAR ENGINEERING

CENTER FOR CATALYTIC SCIENCE AND TECHNOLOGY

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SPRING WEBINAR

MARK SNYDER
LEHIGH UNIVERSITY
Associate Professor

WEDNESDAY, FEB. 3, 2021
at 10:00 AM (E.S.T)

SUSTAINABLE SYNTHESIS OF FUNCTIONAL NANOMATERIALS FOR ENERGY APPLICATIONS

The development of sustainable energy systems often demands the engineering of novel functional materials capable, for example, of efficient energy conversion and/or storage. At the same time, it requires the sustainability of the material synthesis itself. To this end, this seminar will explore our work in the area of alternative 'green', aqueous phase synthesis of a compositionally diverse range of size-tunable nanoparticles spanning from 1) biomineralized quantum dots (QDs) that offer promise for sustainable solar energy conversion to 2) silica nanoparticles (NPs) that can be assembled to sacrificially template and uniquely structure functional energy materials. The seminar will highlight our work in the scalable biomineralization-based synthesis of high-quality CdS QDs (and QDs of other 'greener' compositions) by immobilized enzymes for solar cell sensitization and photocatalytic hydrogen generation at functional levels consistent with conventionally synthesized (i.e., high temperature, toxic solvents) QDs. The seminar will also highlight the aqueous amino acid-mediated synthesis and assembly of size-tunable (ca. 5-50 nm) inert silica nanoparticles for which the template (silica)-replica (carbon) interface serves as a potentially versatile, but generally unexploited handle for tailoring the microstructure and thereby performance of carbon-based electrochemical double layer capacitors (EDLCs). In both cases, this seminar will aim to highlight synthetic routes to functional energy materials that satisfy principles of 'green' engineering.

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NOTE: SEMINARS/WEBINARS ARE SCHEDULED AT **EASTERN STANDARD TIMES (E.S.T.)**