



CHEMICAL AND BIOLOGICAL ENGINEERING DEPARTMENT SEMINAR SERIES

Materials Chemistry in the Service of Solar Energy and Fuel Cells

Presented by: Krishnan Rajeshwar, Center for Renewable Energy Science and Technology, UT Arlington

Time: Wednesday, September 10; 3:15 – 4:30 pm

Location: Perlstein Hall Auditorium

Short Abstract

Hydrogen and methanol have taken on added importance as energy carriers these days in view of the current concerns with rising fuel costs, exponentially increasing energy demand in many parts of the world, over-reliance on fossil fuels, and global warming and air pollution problems stemming from the use of carbon-based energy. Making hydrogen from sunlight and water is an eminently attractive option: it uses only renewable resources and can be done by splitting water using solar energy via thermal, biological, or electrical (i.e., photovoltaic) routes. Similarly, reducing CO₂ to value-added fuels such as methanol can be done either electrochemically or in solar photoelectrochemical cells. This talk focuses on how materials chemistry, electrochemistry, and photoelectrochemistry converge in the development of new generations of electrode materials and electrocatalysts for solar cell and fuel cell applications. Specifically, mild and energy-efficient synthesis of oxide semiconductors, composites, and nanotube arrays via electrosynthesis and combustion synthesis will be outlined.

Short Biography

Dr. Rajeshwar is Associate Dean in the College of Science and a charter member of UT Arlington's Academy of Distinguished Scholars. Specializing in Solid-State Chemistry, Electrochemistry, and Materials Chemistry, he received a Ph.D. degree from the Indian Institute of Science and was a post-doctoral fellow and research associate at Colorado State University prior to joining UT Arlington in 1983. He is a Fellow of the Electrochemical Society and editor of the society's Interface magazine. He is the author of two books, several book chapters and some 450 articles in peer-reviewed journals.