

THE DEPARTMENT OF ELECTRICAL & COMPUTER ENGINEERING SPEAKER SERIES

PRESENTS

Photoelectrochemical Investigations of Semiconductor Surfaces and Catalyst Interfaces for Clean Energy

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LECTURE ABSTRACT

Abundant solar energy holds the promise for addressing the future global energy challenge. The primary obstacle to fully applying solar energy technology is the lack of an efficient and low-cost solar energy harvesting and conversion system. Our research efforts at The University of Alabama primarily focus on developing efficient electrode materials to help address global energy challenge. These electrode materials may contain multicomponent, engineered structures of low-cost materials for efficient light energy absorption, charge separation, charge transport, and fuel conversion, which are key steps involved in solar cell and solar water splitting technologies. This presentation will primarily focus on low-cost water oxidation catalyst NanoCOT electrode which contains earth-abundant elements and operating efficiently in an alkaline solution for oxygen evolution reaction (OER), surface plasmon enhanced thin film photocatalysts, and MoS₂ coated p-type semiconductor for solar water splitting with enhanced stability and catalytic activity. Spectroelectrochemistry techniques such as dark field scattering and electrogenerated chemiluminescence for resolving electrocatalyst at single nanoparticle level will be discussed in this presentation in order to study the structure-function relationship of electrocatalysis systems containing nanostructures.

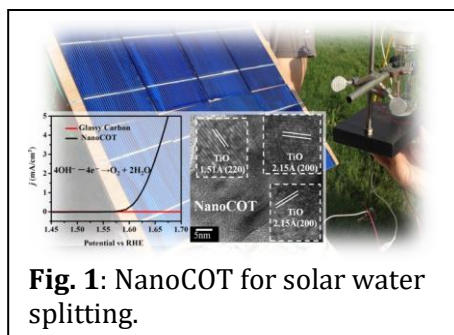


Fig. 1: NanoCOT for solar water splitting.

SPEAKER BIOSKETCH

Shanlin Pan is a full professor in The Department of Chemistry and Biochemistry in The College of Arts and Sciences at The University of Alabama. Professor Pan earned his B.A. (1998) and M.A. (2001) from Lanzhou University of P. R. of China, and his Ph.D. (2006) from University of Rochester, NY. Before embarking on his independent academic career at UA, he was an ACS Irving S. Sigal postdoctoral fellow at the University of Texas at Austin, TX. Dr. Pan is a recipient of The College of Arts and Sciences Leadership Board Faculty Fellow (2017-2019), and 2018 University of Alabama President's Research Award. Dr. Pan teaches undergraduate courses, including Quantitative Analysis, General Chemistry and Electrochemistry Principles and Methods. He is also actively involved in outreach activities in Alabama by working with local high and middle school students & teachers on chemistry and science modules and summer courses.

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