

International Summit on Industrial Engineering

December 08-10, 2014 DoubleTree by Hilton Hotel San Francisco Airport, USA

Hybrid nanomaterials and new designs for sustainable energy storage applications

Leela Mohana Reddy Arava
Wayne State University, USA

In response to the ever increasing energy demands of modern society and in view of emerging ecological concerns, it is now essential to provide efficient, cost-effective, and environmental friendly energy storage devices. Rechargeable Lithium-ion batteries and Supercapacitors are amongst the most promising candidates in terms of their wide spread applicability, and tremendous potential owing to their high energy and power densities. The performance of these devices is inherently tied to the properties of materials used to build them. This talk will focus on the enhancement of these properties for next generation energy devices through nanoscale engineering and novel designs. Research efforts in miniaturizing the conventional Li-ion battery configurations through tailored designs such as three-dimensional and nano-wire batteries will be presented. Improving the performance of Li-ion batteries by using next generation electrode materials such as engineered Si nanostructures and carbons will also be presented. With growing concerns about the ecological footprint of energy industry, more sustainable and environmental friendly approaches are being called for. Recent efforts addressing these issues, including, recycling used silicon wafers into flexible battery components and transforming biodegradable plant extract to green batteries, will also be discussed.

Biography

Leela Mohana Reddy Arava received his PhD (2007) in Physics from Indian Institute of Technology Madras. He conducted his Postdoctoral research at University of Pittsburgh and Rice University. He then spent a year as a Research Scientist at Rice University. In fall 2013, he joined Wayne State University as an Assistant Professor of Mechanical Engineering. His research focuses on nanoscale engineering and alternative energy technology especially focusing on lithium-ion rechargeable batteries, fuel cells and supercapacitors. He has published more than 60 papers in peer-reviewed international journals and delivered about 35 invited talks and seminars in academia and industry.

leela.arava@wayne.edu