DECOUPLING FUEL CELLS AND HYDROGEN: 
DEVELOPING FUEL CELL SYSTEMS FOR AVAILABLE FUELS

Friday, December 3, 2010 | 2:00 pm | DeWALT Seminar Room, 2164 Martin Hall

Abstract: Near-term viability of the fuel cells will depend in large part on meeting the challenges to make efficient and affordable fuel cell systems that operate on more readily available fuels. This presentation will elaborate on some of those challenges for both low-temperature PEM fuel cells (PEMFCs) and high-temperature solid oxide fuel cells (SOFCs). The presentation will discuss research at UMD to address both fundamental and system level issues related to some of these challenges. Efforts between UMD and Ballard Power Systems to develop a 5 kW liquid-hydrocarbon PEMFC system will be discussed. This effort links fundamental research in new nano-structured electrocatalysts and improved membrane reactors to higher-level system modeling, design, and demonstration. The talk will then turn toward efforts to improve understanding of SOFC performance with available fuels. Studies of micro-fabricated electrodes will be presented wherein well-characterized electrode structures with in situ spectroscopy are used to isolate chemical and physical processes and thereby to provide a basis for the development of improved SOFC modeling tools at the micro-structural level and at the full system level.

Biography: Prof. Greg Jackson is in the Department of Mechanical Engineering at the University of Maryland. His group is active in research exploring electrocatalysis in SOFC’s, reformate-tolerant PEM fuel cells, and catalysis for hydrocarbon oxidation and H₂ production from hydrocarbons. Dr. Jackson received his Ph.D. from Cornell University in Mechanical Engineering. After Cornell, Dr. Jackson spent several years at Precision Combustion Inc., where he managed projects related to catalytic systems for ultra-low-NOₓ combustion and for ignition stabilization in diesel engines and gas turbines. Dr. Jackson joined Maryland in 1997 where he now manages the Ballard Power Systems Fuel Cell Laboratory.

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