

**MECHANICAL ENGINEERING DEPARTMENT
ME/ISYE 8773-8774**

Renewable Solar-thermal Production of Fuels from Water and Biomass

by

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Wednesday, October 1, 2008

3:15 p.m. — Refreshments before the seminar

3:30 p.m. — Graduate Seminar

Room 1130 Mechanical Engineering

ABSTRACT — Concentrated sunlight is used to achieve ultra high temperatures in an efficient and clean manner. Solar-thermal reactors have been designed, constructed and tested on-sun for the splitting of water through thermochemical cycles and for the rapid dissociation of cellulosic biomass to intermediate syngas. This presentation will focus on (1) base thermodynamic considerations for using solar energy to drive highly endothermic reactions, (2) experimental results for both water splitting and biomass conversion reactions, (3) materials challenges/solar reactor design, and (4) economics/process scalability. The ZnO/Zn water splitting cycle and the rapid conversion of cellulosic biomass -without producing tars and with > 90% utilization of the biomass will be reviewed with experimental results presented. Finally, the challenges and opportunities for the commercialization of solar-thermal processes will be discussed.

BIO — **Al Weimer**, H.T.Sears Professor of Chemical and Biological Engineering, joined the faculty of the University of Colorado after a 16-year career with the Dow Chemical Company. He was named Dow Research Inventor of the Year in 1993 and received Dow's "Excellence in Science Award" in 1995 for commercializing high temperature processing to produce advanced materials. He was named University of Colorado Inventor of the Year in 2004 and received both the campus wide and the College of Engineering and Applied Science Faculty Research Awards in 2005. He is recipient of the 2005 DOE Hydrogen Program R&D Award in recognition of outstanding achievement in R&D for solar-driven high-temperature thermochemical cycles for hydrogen production. He is Executive Director of the Colorado Center for Biorefining and Biofuels, a partnership of the three major research universities in Colorado and the National Renewable Energy Laboratory. His former students have co-founded three spin-off companies out of his university laboratory.



Informal Faculty Luncheon: Wednesday, October 1, 2008, 12:00 noon. Meet in 1100 ME and walk to lunch with other faculty. Prof. Al Weimer will be able to attend. Host: Prof. Jane H. Davidson