Aerospace Engineering & Mechanics Seminars
Co-hosted this week by the Department of Mechanical Engineering

Friday
25 Feb 2011
2:00 P.M.

Engineering Bldg
Room 300

SAN DIEGO STATE UNIVERSITY

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Fuels from Water, CO2, and Solar Energy

Prof. Aldo Steinfeld

Department of Mechanical and Process Engineering, ETH Zurich, Switzerland

and

Solar Technology Laboratory, Paul Scherrer Institute, Switzerland

Solar thermochemical processes for the production of hydrogen, syngas, metals, and synthetic liquid fuels make use of concentrated solar radiation as the energy source of high-temperature process heat. Considered are H_2O/CO_2-splitting thermochemical cycles via metal oxide redox reactions, reforming/gasification/decomposition processes for the thermal conversion of biomass and other carbonaceous feedstock, and CO_2 capture/recycling. R&D work encompasses fundamental studies on thermodynamics, reaction kinetics, heat/mass transfer, and chemical reactor engineering. Solar reactor prototypes – at the 10 kW power level – are designed, fabricated, modeled, and tested in a high-flux solar furnace, further optimized for maximum solar-to-chemical energy conversion efficiency, and finally scaled-up for industrial applications – at the MW power level – using concentrating solar tower technology.

Biography

Aldo Steinfeld is Professor at the Dept. of Mechanical and Process Engineering of ETH Zurich, where he holds the Chair of Renewable Energy Carriers. He further leads the Solar Technology Laboratory of the Paul Scherrer Institute. His research program is aimed at the advancement of the thermochemical engineering sciences, with applications in solar fuels production, fossil fuel decarbonization processes, and CO_2 mitigation technologies. Prof. Steinfeld is member of the Swiss Academy of Engineering Sciences. http://www.pre.ethz.ch/