

The Red Planet and The Blue Planet: Past, Present and Future Symposium Speakers

Integrated Carbon Dioxide Capture and Conversion to Renewable Fuels and Feedstocks: The Methanol Economy

Presented by Plenary Speaker:

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Professor Surya Prakash was born in 1953 in Bangalore, India. He holds a B.Sc. (Hons) from the Bangalore University and a M.Sc. from the Indian Institute of Technology, Madras. He obtained his Ph. D. degree under the tutelage of late Professor Olah (1994 Nobel Laureate) at USC in 1978. He joined the USC faculty in 1981 and is now a Professor and Director holding the Olah Nobel Laureate Chair at the Loker Hydrocarbon Research Institute. His research encompasses superacid, hydrocarbon, synthetic organic, organosilicon, electro- and organofluorine chemistry, with an emphasis on energy storage, greenhouse gas abatement and catalysis. He is a prolific author with 835 publications, 117 patents and 14 books. He has received four ACS Awards: the 2004 *Creative Work in Fluorine Chemistry*, the 2006 *George A. Olah Award in Hydrocarbon or Petroleum Chemistry*, the 2006 *Richard C. Tolman Award* and the 2018 *Late Career Cope Scholar Award*. He has shared with the late Professor Olah, the inaugural \$1 Million the 2013 Eric and Sheila Samson Prime Minister's Prize for Innovation in Alternative Fuels for Transportation by Israel. In 2015, he won the Henri Moissan International Prize for excellence in Fluorine Chemistry. He is an elected Fellow of many prestigious academies.

Abstract:

Renewable methanol synthesized from carbon dioxide capture and conversion using water and renewable energies such as solar, wind, geothermal, atomic, etc., is a simple solution in the long run to a complex climate change carbon conundrum. Liquid methanol is a versatile high octane, clean burning automotive fuel (to replace gasoline and diesel), a fuel for direct oxidation methanol fuel cell, chemical feedstock to make ethylene, propylene and myriad of other chemicals and a convenient hydrogen storage medium that can replace fossil fuels in almost all applications without inflicting major changes to the existing infrastructure. Our recent studies on integrated carbon dioxide capture from point sources including air and its reductive conversion to methanol and methane (principal component of natural gas) with hydrogen will be discussed using homogeneous as well as heterogeneous catalysts under moderate reaction conditions.