GCEP Research Symposium

New Research Directions in a Rapidly Evolving Global Energy Landscape

September 30 - October 2, 2009

Frances C. Arrillaga Alumni Center

STANFORD UNIVERSITY

Wednesday, September 30

8:00 – 8:30	***CONTINENTAL BREAKFAST***	
8:30 – 9:40	**Introduction and Keynotes**	
8:30	GCEP Welcome	Sally Benson, *Stanford*
8:40	Keynote Address – Report from the America's Energy Future panel at the National Academy of Sciences	Mark Wrighton, *Washington University in St Louis*
9:40–11:55	**Perspectives on the Need for Innovative and Transformative Energy Research in the Current Global Environment**	***Chair:*** **Sally Benson**
9:40	Accelerating Energy Innovations - What is Important and What is Not	John Deutch, *MIT*
10:15– 10:45	***BREAK***	
10:45	Technological Innovation: The Cornerstone of Value	Jeff Keller, *GE*
11:20	Basic Research Needs in Solar Energy Utilization	Nate Lewis, *Caltech*
11:55 – 1:00	***LUNCH***	
1:00 – 5:30	**Highlights and Future Directions for Innovative Energy Research**	***Chair:*** **Lynn Orr**
1:00	Advanced Batteries	Yi Cui, *Stanford*
1:40	Biofuels from Bacteria	Chaitan Khosla, *Stanford*
2:20	Advanced Combustion	Chris Edwards, *Stanford*
3:05 – 3:35	***BREAK***	
3:35	Electricity Infrastructure	Kevin Tomsovic, *U Tennessee*
4:15	Results from America's Energy Future Panel on Liquid Transportation Fuels from Coal and Biomass	Michael P. Ramage, *ExxonMobil Research and Engineering Company (retired),* Jim Sweeney, *Stanford*
5:30	***ADJOURN***	
5:30 – 6:45	**Reception**	

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Thursday, October 1

8:00 – 8:30	***CONTINENTAL BREAKFAST***	
8:30 – 9:00	**Renewable Energy Analysis**	**Chair: *Sally Benson***
8:30	Insights and Opportunities: Technologies, Policies and Markets for Clean Energy Solutions	Doug Arent, *NREL*
9:00 – 12:00	**Biofuels and Bioenergy Conversion**	***Chair:* Chris Field**
9:00	Biomass Energy: the Climate-Protective Domain	David Lobell, *Stanford*
9:30	Assembly of a Lignin Modification Toolbox	Clint Chapple, *Purdue University*
10:00	Immobilization of ß-Glucosidase on Porous Sol-gel Polymers for Enhanced Bioactivity	Maria Dulay, *Stanford*
10:30	Biofuels and Bioenergy Conversion Poster Session	
12:00 – 1:30	***LUNCH***	
1:30 – 5:00	**Carbon Capture and Storage**	**Chair: *Sally Benson***
1:30	A Strategy for Exploiting Unconventional Gas Resources Incorporating CO_2 Sequestration	Mark Zoback, *Stanford*
2:00	Controlled Freeze Zone™ Technology: An Integrated Solution for Processing Sour Natural Gas	Chuck Mart, *ExxonMobil*
2:30	Geological Sequestration of CO_2 - An Exploratory Study of the Mechanisms and Kinetics of CO_2 Reaction with Mg-Silicates	Gordon Brown, *Stanford*
3:00	Collaborative Research on Carbon Sequestration in Saline Aquifers in China	Kristian Jessen, *University of Southern California*
3:30	Carbon Capture and Storage Poster Session	
5:00	***ADJOURN***	
5:30	***SPEAKER RECEPTION AND DINNER***	

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Friday, October 2

8:00 – 8:30	***CONTINENTAL BREAKFAST***	
8:30 – 9:00	**Global Exergy Analysis**	**Chair: *Sally Benson***
8:30	Exergy and Carbon Flow in Natural and Human Systems	Richard Sassoon, *Stanford*
9:00 – 12:00	**Solar Energy**	***Chair*: Nate Lewis**
9:00	Plasmonic Photovoltaics	Mark Brongersma, *Stanford*
9:30	Photo-electric Enhancement of Thermionic Emission	Nick Melosh, *Stanford*
10:00	Ultra-High Efficiency Thermo-Photovoltaic Cells Using Metallic Photonic Crystals as Intermediate Absorber and Emitter	Shanhui Fan, *Stanford*
10:30	Solar Energy Poster Session	
12:00 – 1:15	***LUNCH***	
1:15 – 5:00	**Advanced Energy Transformations and Storage**	***Chair:* Chris Chidsey**
1:15	Metal Oxide Nanotubes and Photo-Excitation Effects: New Approaches for Low Temperature Solid Oxide Fuel Cells to Enable Low GWG-Emission Transportation	Paul McIntyre, *Stanford*
1:45	Nano-structured MoS_2 and WS_2 for the Solar Production of Hydrogen	Tom Jaramillo, *Stanford*
2:15	High Capacity Molecular Hydrogen Storage in Novel Crystalline Solids	Wendy Mao, *Stanford*
2:45	The Electron Economy: Oxidation Catalysis for Energy Management	Bob Waymouth, *Stanford*
3:15	Advanced Energy Transformations and Storage Poster Session	
5:00	***ADJOURN***	