

GCEP Seventh Annual Research Symposium
Addressing the Changing Energy Landscape

October 4 – 5, 2011

Francis C. Arrillaga Alumni Center
Stanford University

Tuesday, October 4, 2011

Morning		
7:45 – 8:30	McCaw Hall	<i>Check-In, Continental Breakfast*</i>
8:30 – 9:00	McCaw Hall	Welcome and Global Climate and Energy Project 2011 Sally Benson , Director, Global Climate and Energy Project, Stanford University
9:00 – 10:00	McCaw Hall	Deployment of Renewable Energy Resources at Speed and Scale Dan Arvizu , Director and Chief Operating Officer, National Renewable Laboratory (NREL)
10:00 – 10:30	Ford Gardens	<i>Break*</i>
10:30 – 11:15	McCaw Hall	Global Warming Gridlock David Victor , Professor - School of International Relations and Pacific Studies Director - Laboratory on International Law and Regulation, University of California at San Diego
11:15 – 12:30	McCaw Hall	GCEP Distinguished Student Lecturers Moderator: Sally Benson , Stanford University Inorganic/Organic Hybrid Tandem Solar Cells Erik Garnett , Postdoctoral Scholar, Materials Science and Engineering, Stanford University CO₂ Sequestration Using Direct Mineral Carbonation of Mg-silicates Natalie Johnson , Graduate Student, Chemical Engineering, Stanford University Photon-enhanced Thermionic Emission for Concentrated Solar Jared Schwede , Graduate student, Physics, Stanford University Conversion of Biomass to Hydrogen Through a Synthetic Enzyme Pathway Phillip Smith , Graduate Student, Chemical Engineering, Stanford University
12:30 – 1:30	Sy Oak Grove	<i>Lunch* and Book Signing by David Victor</i>

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Tuesday, October 4, 2011 (continued)

Afternoon		
GCEP Research – Technical Talk: Carbon-Based Energy Systems		Energy Tutorial: Solar Energy 101
1:30 – 3:15	McCaw Hall	<p>Moderator: Chris Edwards Stanford University</p> <p>Presenters: Shingo Kazama, Research Institute for Innovative Technology for the Earth (RITE), <i>Advanced CO₂/H₂ Separation Materials Incorporating Active Functional Agents</i></p> <p>Kate Maher, Stanford University, <i>Reactivity of CO₂ in the Subsurface</i></p> <p>Sally Benson, Stanford University, <i>Multiphase Flow of CO₂ and Brine in Rocks</i></p>
		<p>1:30 – 3:15</p> <p>Fisher Conference Center</p> <p>Energy Tutorial: Solar Energy 101</p> <p>Michael McGehee Stanford University</p>
Poster Session and Reception*		
3:15 – 5:30	Ford Gardens	<p>GCEP researchers present posters in all theme areas:</p> <ul style="list-style-type: none"> • <i>Advanced Energy Transformations and Storage</i> • <i>Bioenergy</i> • <i>Carbon-Based Energy Systems</i> • <i>Solar Energy</i>
5:30 – 7:30	McCaw Hall	GCEP Student Social (for GCEP graduate students and postdoctoral fellows only)

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Wednesday, October 5, 2011

Morning					
7:15 – 8:00	McCaw Hall	<i>Continental Breakfast*</i>			
GCEP Research – Technical Talk: Solar Energy			Energy Tutorial: Electric Grid 101		
8:00 – 9:45	McCaw Hall	<p>Moderator: Nate Lewis, California Institute of Technology</p> <p>Presenters: Michael McGehee, Stanford University, <i>Advanced Electron Transport Materials for Application in Organic Photovoltaics (OPV)</i></p> <p>Zhenan Bao, Stanford University, <i>Organic and Carbon Nano Materials for Solar Cells</i></p> <p>Gavin Conibeer, University of New South Wales, <i>Hot Carrier Solar Cell: Implementation of the Ultimate Photovoltaic Converter</i></p>	8:00 – 9:45	Fisher Conference Center	<p>Energy Tutorial: Electric Grid 101</p> <p>Thomas Overbye University of Illinois - Urbana Champagne</p>
9:45 – 10:15	Ford Gardens	<i>Break*</i>			
GCEP Research – Technical Talk Bioenergy			Energy Tutorial: Shale Gas 101		
10:15 – 12 pm	McCaw Hall	<p>Moderator: David Lobell, Stanford University</p> <p>Alfred Spormann, Stanford University, <i>Synthesis of Biofuels on Bioelectrodes</i></p> <p>Wout Boerjan, Ghent University, <i>Towards New Degradable Lignin Types</i></p> <p>Chris Field, Carnegie Institution, Stanford University, <i>The Climate-Protective Domain</i></p>	10:15 – 12 pm	Fisher Conference Center	<p>Energy Tutorial: Shale Gas 101</p> <p>Mark Zoback Stanford University</p>
12:00 – 1:00	McCaw Hall <i>Lunch*</i>	<p>Discussion with George Shultz and Thomas Stephenson – Principals of the Hoover Institution’s Shultz-Stephenson Task Force on Energy Policy: Addressing threats to national security and adverse effects on global climate through our energy use</p>			

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Wednesday, October 5, 2011 (continued)

Afternoon - GCEP Research Themes and Concurrent Energy Tutorials					
GCEP Research – Technical Talk: Advanced Energy Transformations and Storage			Energy Tutorial: Carbon Capture 101		
1:00 – 2:45	McCaw Hall	<p>Moderator: Yi Cui, Stanford University</p> <p>Thomas Overbye, University of Illinois - Urbana Champagne, <i>Simulation and visualization of power grid operation with high renewable penetration</i></p> <p>Ray Baughman, University of Texas at Dallas, <i>Novel Materials for Energy Storage Solution</i></p> <p>Shanhui Fan, Stanford University, <i>Applying sub-wavelength electromagnetics and nano-photonics to energy conversion and transfer</i></p>	1:00 – 2:45	Fisher Conference Center	<p>Energy Tutorial: Carbon Capture 101</p> <p>Jen Wilcox Stanford University</p>
2:45 – 3:15	Ford Gardens	<i>Break*</i>			
Afternoon Plenaries					
3:15 – 4:00	McCaw Hall	<p>Moderator: Lynn Orr, Director, Precourt Institute for Energy, Stanford University</p> <p>Perspectives on Nuclear Energy Burton Richter, Nobel Laureate - Physics (1976), Senior Fellow - Stanford University, Director Emeritus - SLAC National Accelerator Laboratory</p>			
4:00 – 4:45	McCaw Hall	<p>Creating a New Energy Economy in America: Bill Ritter, Former Governor of Colorado (2007 – 2011), Director - Center for the New Energy Economy, Colorado State University</p>			
4:45 – 5:00	McCaw Hall	<p>GCEP Student Awards Closing Remarks Sally Benson, Director, Global Climate and Energy Project, Stanford University</p>			