

**ASME 2<sup>nd</sup> Energy Nanotechnology International Conference – Final Program**  
**September 5-7, 2007, Santa Clara University, Santa Clara, CA**

**Wednesday, Sept. 5, 2007 – Benson Memorial Center, California Mission Room**

7:00 - 8:00 AM	Morning registration coffee/tea – California Mission Lobby
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<b>Plenary Session (Speaker introductions by Conference Chair Tim Fisher)</b>	
8:00 – 8:15 AM	Opening remarks by M. Godfrey Mungal, Dean of Engineering, Santa Clara University
8:15 – 9:00 AM	Opening Plenary - Dr. Martin Keller (Director, BioEnergy Science Center; Director, Biosciences Division, Oak Ridge National Laboratory)  <i>Case Study: The BioEnergy Science Center and the Importance of Nanotechnology in Bioenergy Research</i>
9:00 – 9:40 AM	Plenary - Dr. Martha Krebs, Deputy Director for R&D, California Energy Commission  <i>California's Clean Energy &amp; Climate Response Imperative: Where Is the Room at the Bottom?</i>
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9:40 – 10:00 AM	Coffee Break
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<b>Keynote Session (Speaker introductions by Program Chair Andrei Fedorov)</b>	
10:00 - 10:45 AM	Keynote – Arun Majumdar, University of California - Berkeley <i>Global Energy: Demand, Supply, Consequences, Opportunities</i>
10:45 - 11:30 AM	Keynote – Dr. Deepak Srivastava, NASA Ames Research Center & Nanoexa <i>Nano in Near Term Commercially Viable Energy Storage &amp; Generation Technologies</i>
11:30 - 1:00 PM	Lunch – Williman Room/Williman Patio Poster Set-up – California Mission Room
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**Track 2 - Fossil Fuels & Biofuels**

*Track Chair: Laurent Pilon, University of California, Los Angeles, Los Angeles, CA, United States*

*Track Co-Chair: Yiguang Ju, Princeton University, Princeton, NJ, United States*

**Session 2-1 Fossil Fuels & Biofuels**

1:00 -1:30 PM	ENIC2007-45044: <b>Recent Developments in Micropower Generation Using Hydrocarbon Fuels (Presentation Only)</b> , <b>Paul Ronney</b> , University of Southern California, Los Angeles, CA, United States
1:30 - 2:00 PM	ENIC2007-45053: <b>Synthetic Gasoline and Diesel from Coal and Mixed Prairie Grasses for Carbon-Constrained World (Presentation Only)</b> ; <b>Robert</b>

*H. Williams, Princeton Environmental Institute, Princeton, NJ, United States, Stefano Consonni, Giulia Fiorese, Politecnico di Milano, Milan, Italy, Eric D. Larson, Princeton Environmental Institute, Princeton, NJ, United States*

2:00 - 2:30 PM ENIC2007-45035: **CO2 Capture and the Sustainable Carbon Economy (Presentation Only)**; *David L. Damm, Georgia Institute of Technology, Atlanta, GA, United States, Andrei Fedorov, Georgia Institute of Technology, Atlanta, GA, United States*

2:30 - 3:00 PM ENIC2007-45049: **The Effects of Particle Size, Morphology, and Mass Loading on the Reactivity of Nanocatalytic Particles (Technical)**; *Howard Pearlman, Tiffany Miller, Drexel University, Philadelphia, PA, United States, Brian Fellon, Drexel University, Philadelphia, PA, United States, Christopher Ricuitti, Drexel University, PA, United States, Yi Ma, Drexel University, Philadelphia, PA, United States*

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3:00 – 3:30 PM Coffee Break – California Mission Lobby

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### **Track 3 Direct Thermal Energy Conversion & Harvesting**

*Track Chair: Theodorian Borca-Tasciuc, Rensselaer Polytechnic Institute, Troy, NY, United States*

#### **Session 3-1 Direct Thermal Energy Conversion**

3:30 - 4:00 PM ENIC2007-45062: **Metal/Semiconductor Nanocomposites for Direct Thermal to Electric Energy Conversion (Extended Abstract)**; *Ali Shakouri, University of California Santa Cruz, Santa Cruz, CA, United States*

4:00 - 4:30 PM ENIC2007-45046: **Optimization of the Electron and Phonon Transport in Quantum Dot Superlattices for Thermoelectric Applications (Presentation Only)**; *Alexander Balandin, University of California - Riverside, Riverside, CA, United States*

4:30 - 6:30 PM **Poster Session/Exhibits/Reception** – California Mission Lobby

### **Thursday, Sept. 6, 2007 – Benson Memorial Center – California Mission Room**

8:00 - 8:30 AM Registration/coffee/tea – California Mission Lobby

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8:30 - 9:30 AM **Commercialization Plenary Session**

8:30 - 9:30 AM Wasiq Bohkari, Quantum Insight

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9:30-10:00 AM Poster/Exhibits/Coffee Break – California Mission Room & Lobby

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**Track 1 - Solar and Nanomanufacturing**

Track Chair: **Jorge Gonzalez**, SCU, Santa Clara, CA, United States

Track Co-Chair: **Xianfan Xu**, IN, United States

**Session 1-1 Solar and Nanomanufacturing**

- 10:00 - 10:30 AM ENIC2007-45073: **Plasma Synthesis & Functionalization of Group Nanocrystals for Photovoltaic Applications (Presentation Only)**; **Uwe Kortshagen, Zak Holman, Ryan Gresback, Chin-Yi Liu**, University of Minnesota, Minneapolis, MN, United States
- 10:30 – 11:00 AM Chris Eberspacher, CTO & VP for Engineering, Nanosolar Inc., *invited*
- 11:00 – 11:30 am K. V. Ravi, Director, Solar Business Group, Applied Materials, *invited*
- 11:30 am – Noon ENIC2007-45029: **Bi2Te3 Nanowire Array/Epoxy Composites for Thermoelectric Power Generators and Microcoolers (Technical)**; **Kalapi G. Biswas, Timothy D. Sands, Vijay Rawat, Manuel DaSilva**, Purdue University, West Lafayette, IN, United States
- Noon - 12:30 PM ENIC2007-45070: **High figure-of-merit achieved in nanostructured thermoelectric SiGe alloys (Presentation Only)**; **Z. F. Ren**, Boston College, Chestnut Hill, MA, United States

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12:30 - 1:30 PM Lunch – Williman Room/Williman Patio

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1:30 - 3:30 PM **Afternoon Startup Showcase, chaired by: Wasiq Bohkari, Quantum Insight**

**Judges:**

Tom Moran, Foley & Lardner  
Jim Simmons, Draper Richards Venture Capital  
Nick Sugimoto, Honda Strategic Venturing  
Bill Wilson, Blumberg Capital Partners  
Aubrey Helms, Tiger Venture Analysis

**Presenting Companies:**

High Merit Thermoelectrics, Geoff Jennings  
Silicon Valley Solar, Lenny Sharp  
CRJ Solar, Carlo Treves  
Abundant Fuels, Jim Love

3:30 - 5:00 PM **Afternoon Panel on Commercialization, chaired by: Anthony Waitz, Quantum Insight**

**Panelists:**

Bill Scott, Agland Investment Services, Worldwide  
Nick Sugimoto, Honda Strategic Venturing  
Ralph Jacobs, Lawrence Livermore Labs  
Eric Wesoff, Greentech Media

Rich Helfrich, Alameda Capital LLC

5:00 - 5:15 PM Introductory comments by Professor Terry Shoup, former Dean of Engineering, Santa Clara University

5:15 - 7:00 PM **Poster Session/Exhibits/Reception** – California Mission Room & Lobby

### **Friday, September 7, 2007 – Benson Memorial Center – California Mission Room**

7:30 – 8:00 AM Registration/coffee/tea – California Mission Room & Lobby

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#### **Track 4 Hydrogen, Storage and Electrochemical Conversion**

*Track Chair: Yang Shao-Horn*

*Track Co-Chair: Jinsong Zhang, Shell Hydrogen and Shell Global Solutions, Inc, Houston, TX, United States*

#### **Session 4-1 Hydrogen**

8:00 - 8:30 AM ENIC2007-45026: **Engineering Hydrogen Storage Systems (Extended Abstract); Scott Jorgensen**, General Motors R&D, Warren, MI, United States

8:30 - 9:00 AM ENIC2007-45014: **The Science and Technology of Al-Ga Alloys as a Material for Energy Storage, Transport and Splitting Water (Technical); Jerry Woodall, Jeffrey Ziebarth, C.R. Allen**, Purdue University, West Lafayette, IN, United States

9:00 - 9:30 AM ENIC2007-45025: **Development and Characterization of Complex Hydrides using Novel Techniques (Presentation Only); Dr. Polly Bersath**, Savannah River National Laboratory (SRNL), Aiken, SC, United States

9:30 -10:00 AM **Coffee/Poster/Exhibit Break** – California Mission Room & Lobby

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#### **Session 4-2 Electrochemical Conversion**

10:00 - 10:30 AM ENIC2007-45061: **Influence of Catalyst-Layer Microstructure on Performance and Durability in Proton-Exchange Membrane Fuel Cells (Presentation Only); Jeremy P. Meyers**, University of Texas, Austin, United States

10:30 - 11:00 AM ENIC2007-45060: **Combinatorial Development of Ternary Electrocatalysts for Methanol Oxidation (Technical); Peter Strasser**, University of Houston, Houston, TX, United States

11:00-11:30 AM Closing Remarks/End – Conference Chair Tim Fisher

## 5-1 Poster Presentations

ENIC2007-45008: **Immobilization of Alcohol Dehydrogenase Enzyme at Chemically Functionalized Diamond Nanoparticles for Biofuel Cell Applications (Poster)**; *Eduardo Nicolau, University of Puerto Rico, Trujillo Alto, Puerto Rico, Carlos Cabrera, Maritere Berberena, University of Puerto Rico, San Juan, Puerto Rico*

ENIC2007-45012: **Lithium Intercalation into Single-Wall Carbon Nanotubes Chemically Attached to Polycrystalline Platinum Electrodes (Poster)**; *Belinda Rosario, Michelle Morales, Carlos Cabrera, University of Puerto Rico, San Juan, Puerto Rico*

ENIC2007-45013: **Hydrogen Storage of Thin Films of Mg Deposited by Pulsed Laser Deposition (Presentation Only)**; *Matthew Rogers, UC Berkeley, Berkeley, CA, United States, Samuel Mao, LBL, Berkeley, CA, United States, Costas Grigoropoulos, UC Berkeley, Berkeley, CA, United States*

ENIC2007-45023: **Effect of the Excess Volume of Lattice Defects on the Enthalpy of Formation and Desorption Temperature of Metal Hydrides (Technical)**; *Vincent Berube, Gregg Radtke, Gang Chen, Mildred Dresselhaus, MIT, Cambridge, MA, United States*

ENIC2007-45027: **Technology development at Shell Hydrogen: The road to clean and green H<sub>2</sub> (Presentation Only)**; *Joep Huijsmans, Shell Hydrogen B.V., Hague, Netherlands, Jinsong Zhang, Shell Hydrogen and Shell Global Solutions, Inc, Houston, TX, United States*

ENIC2007-45030: **Wet-chemical and Flame Synthesis of Upconverting Nanophosphors for Security, Energy, Display and Biological Applications (Poster)**; *Jingning Shan, Xiao Gin, Yiguang Ju, Princeton University, Princeton, NJ, United States*

ENIC2007-45032: **Synthesis and Characterization of TiO<sub>2</sub>-xNx Nanostructures for Visible Light Photocatalytic Hydrogen Production (Poster)**; *Andrew Ogden, James L. Gole, Georgia Tech, Atlanta, GA, United States, Andrei Fedorov, Georgia Institute of Technology, Atlanta, GA, United States*

ENIC2007-45036: **CHAMP: Scalable technology for distributed hydrogen production and CO<sub>2</sub> capture (Poster)**; *David L. Damm, Georgia Tech, Atlanta, GA, United States, Andrei Fedorov, Georgia Institute of Technology, Atlanta, GA, United States*

ENIC2007-45037: **Heat Conduction in Metal Hydride Nano-Particles (Technical)**; *Kyle C. Smith, Peter D. Gilbert, Christopher S. Polster, Timothy Fisher, Purdue University, West Lafayette, IN, United States*

ENIC2007-45041: **Light Absorption in Core-Shell Nanowire Arrays (Poster)**; *Lu Hu, Massachusetts Institute of Technology, Cambridge, MA, United States, Gang Chen, MIT, Cambridge, MA, United States*

ENIC2007-45050: **Design of Low Temperature High-Voltage Micro Single-Chamber Solid Oxide Fuel Cell Stacks (Poster)** *Ethan J. Crumlin, Gerardo Jose la O', Massachusetts Institute of Technology, Cambridge, MA, United States, Yang Shao-Horn*

ENIC2007-45057: **Hybrid Solar Cells from Polymers and Silicon Nanocrystals (Poster)**; *Chin-Yi Liu, Uwe Kortshagen, University of Minnesota, Minneapolis, MN, United States*

ENIC2007-45063: **Optimum Field In Lithium Niobate Nano Ferroelectrics (Poster)**; *Asis Kumar BANDYOPADHYAY, Govt. College of Engineering & Ceramic Technology, Kolkata, India*

ENIC2007-45007: **Thermal Management of Downhole Oil&Gas Logging Sensors for HTHP Applications using Nanoporous Materials (Technical)**; *Saeed Rafie, Baker Hughes INTEQ, Houston, TX, United States*

ENIC2007-45038: **Growth of Carbon Nanotubes on Carbon Toray Paper for Bio-Fuel Cell Applications (Short Paper)**; *Bhupesh Chandra, Columbia University, New York, NY, United States, Joshua Kace, Yuhao Sun,*

Columbia University, New York, NY, United States, **Scott C. Barton**, Michigan State University, East Lansing, MI, United States, **James Hone**, Columbia University, New York, NY, United States

ENIC2007-45040: **An Efficiency Entitlement Study for Thermoelectric Generators (Technical)**; **Peter De Bock, Vladimir Novak**, GE Global Research, Niskayuna, NY, United States

ENIC2007-45059: **An integrated plasma process to produce group IV nanocrystal colloids for photovoltaic applications (Presentation Only)**; **Uwe Kortshagen, Xiaodong Pi, Rebekah Anthony, Lorenzo Mangolini**, University of Minnesota, Minneapolis, MN, United States

ENIC2007-45009: **Performance of Nanoscale Quantum Well Thermoelectrics (Technical)**; **Daniel Krommenhoek, Norbert B. Elsner, Saeid Ghamaty, Velimir Jovanovic**, Hi-Z Technology, Inc., San Diego, CA, United States

ENIC2007-45010: **Quantum Well Thermoelectric Materials (Presentation Only)**; **Saeid Ghamaty, Norbert B. Elsner, Velimir Jovanovic, Daniel Krommenhoek**, Hi-Z Technology, Inc., San Diego, CA, United States, **Prabhakar R. Bandaru**, University of California San Diego, La Jolla, CA, United States

ENIC2007-45021: **Thermal Radiation Involving Metallic Nanoparticles in the Near Field (Short Paper)**; **P.-Olivier Chapuis, Marine Laroche, Jean-Jacques Greffet, Sebastian VOLZ**, Ecole Centrale Paris, Châtenay Malabry, France

ENIC2007-45033: **Ab-Initio Molecular Dynamics Study of Nano-Scale Thermal Energy Transport (Technical)**; **Tengfei Luo**, Michigan State University, East Lansing, MI, United States, **John R. Lloyd**, Naval Postgraduate School, Monterey, CA, United States

ENIC2007-45034: **Effects of Gate Field and Surface Passivation on Electron Transport and Thermopower in Individual Indium Antimonide Nanowires (Presentation Only)**; **Jae Hun Seol, Arden Moore, Feng Zhou, Li Shi**, University of Texas at Austin, Austin, TX, United States, **Ye Qi Laura, Raymond Scheffler**, NASA Ames Research Center, Moffett Field, CA, United States

ENIC2007-45042: **Nitride Metal/Semiconductor Superlattices for High Temperature Direct Thermal-to-Electrical Energy Conversion (Technical)**; **Vijay Rawat, Robert Wortman, Timothy Sands**, Purdue University, West Lafayette, IN, United States

ENIC2007-45043: **Thermionic Emission from Potassium-intercalated Carbon Nanotube Arrays for Direct Energy Conversion (Technical)**; **Tyler Westover, Timothy Fisher**, Purdue University, West Lafayette, IN, United States, **Placidus Amama**, Birck Nanotechnology Center, Purdue University, West Lafayette, IN, United States, **Aalap Dighe, Nicholas Lilovich**, Purdue University, West Lafayette, IN, United States

ENIC2007-45052: **Thermoelectric properties characterization of nanostructured thin-films (Presentation Only)**; **Claudiu Hapenciuc, Theodorian Borca-Tasciuc, Arup Purkayastha, Ganapathiraman Ramanath**, Rensselaer Polytechnic Institute, Troy, NY, United States

ENIC2007-45054: **Atomistic Modeling and Optimization of Thermoelectric Properties of SiGe nanowires (Presentation Only)**; **Maria Chan, Ying Shirley Meng, Tim Mueller, Gerbrand Ceder**, Massachusetts Institute of Technology, Cambridge, MA, United States, **John Reed, Trinh Vo, Andrew Williamson**, Lawrence Livermore National Lab, Livermore, CA, United States, **Giulia Galli**, University of California, Davis, Davis, CA, United States

ENIC2007-45048: **Solid Oxide Fuel Cells with Corrugated Nano Thin Film Electrolyte (Presentation Only)**; **Pei-Chen Su, Cheng-Chieh Chao, Rainer Fasching, Fritz B. Prinz**, Stanford University, Stanford, CA, United States

ENIC2007-45058: **Germanium Nanocrystal for Photovoltaic Devices (Presentation Only)**; **Zak Holman, Ryan Gresback, Uwe Kortshagen**, University of Minnesota, Minneapolis, MN, United States

ENIC2007-45072: **The Effect of Water Cooling on Improving Water Pumping Systems Efficiency Powered with PV cells (Poster);** *Mutaz Abuhayeh, MADI & PARTNERS CONSULTING ENGINEERS, Amman, Jordan*

ENIC2007-45071: **Experimental and Theoretical Study of Metal-Hydride Reactors (Poster);** *Yuksel Kaplan, Mahmut D. Mat, Nigde University, Nigde, Turkey, T.Nejat Veziroglu, University of Miami, Coral Gables-FL, FL, United States, Bora Timurkutluk, Hidronerji Co., Ankara, Turkey*

ENIC2007-45065: **Theoretical investigation of TiO<sub>2</sub> solar cells linked with DNA-Oligonucleotide (Poster);** *Imtiyaz Ahmed, Sayeed Mohammed, C.Abdul Hakeem College of Eng & Tech, Vellore, Tamil Nadu, India*

ENIC2007-45069: **Study On The United Operation System Of Solar Energy And LPG Gasification In District (Poster);** *Guohua Shi, Yuefen Gao, Youyin Jing, North China Electric Power University, Baoding, Hebei, China, Jingfang Zhu, Shenzhen Gas Corporation, Shenzhen, Guangdong, China*

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