Ceramic Leadership Summit

Baltimore, MD

www.ceramics.org/cls2011

August 1–3, 2011

Register Now to Save!

Register for the Ceramic Leadership Summit at **www.ceramics.org/cls2011** before May 16th to save $225!

MONDAY, AUGUST 1, 2011

5:00 - 7:00 p.m. Welcome Reception and Networking Event

TUESDAY, AUGUST 2, 2011

9:00 - 9:45 a.m. Coffee
9:45 - 10:00 a.m. Opening Remarks
10:00 a.m. - Noon GENERAL SESSION 1: Advancing Materials Technology in a Complex World
Noon - 1:30 p.m. Networking Lunch
1:30 - 3:15 p.m. GENERAL SESSION 2: Entrepreneurial Case Studies
3:15 - 3:45 p.m. Coffee
3:45 - 5:15 p.m. GENERAL SESSION 3: Business Opportunities and Strategies in Emerging Markets
7:00 - 9:00 p.m. Conference Dinner

*The **Ceramic Leadership Summit** is a unique and powerful meeting, focusing on the most important strategic challenges confronting the ceramic and glass materials communities. **CLS 2011** is open to all and especially beneficial for business executives, research & development professionals, product managers, entrepreneurs, university administrators, government agency policy makers, and ACerS leaders. Unlike purely technical meetings, **CLS 2011** fosters a participative environment that delivers the opportunity to listen, learn and get involved. Register before May 16th to save $225.*

WEDNESDAY, AUGUST 3, 2011

7:30 - 8:30 a.m. Coffee

	TRACK 1: ENERGY INNOVATIONS	TRACK 2: BUSINESS OF CERAMICS	TRACK 3: INNOVATIVE APPLICATIONS FOR CERAMIC MATERIALS
8:30 - 9:25 a.m.	Advances in Solid State Batteries	Emerging Nanomaterials and Nanotechnology Applications, Industry Trends and Current/Future Markets	Ultrahigh Temperature Ceramics for Extreme Environmental Applications
9:30 - 10:25 a.m.	Ceramic Components for Fuel Cells and Other Energy Applications	Raw Materials Trends Impacting the Ceramics and Glass Community	Bioengineering Soft Tissue with Ceramics
10:25 - 10:45 a.m.	Coffee		
10:45 - 11:40 a.m.	Solar Energy Developments	The Market Outlook for Energy-Related Technologies	Advances in Glass Strength and the Impact on Society
11:45 a.m. - 1:00 p.m.	Networking Lunch		
1:00 - 1:55 p.m	Small Modular Nuclear Reactors	Business Valuation (1:00 - 2:55 p.m.)	Ceramic Applications in the Automotive Industry
2:00 - 2:55 p.m.	Material Needs in Alternative & Renewable Energy for the Auto Industry	Raw Material Scarcity and its Impact on the U.S. Advanced Ceramic Technological Development	
2:55 - 3:15 p.m.	Coffee		
3:15 to 5 p.m.	CLOSING GENERAL SESSION: Connecting Research, Technology and Manufacturing		

TUESDAY, AUG. 2, 2011

GENERAL SESSION 1 10:00 A.M. – NOON

Advancing Materials Technology in a Complex World

Two corporate leaders provide their perspectives on the global economic, technological and environmental challenges and opportunities facing the ceramic materials and technologies community. Each talk will be followed by a facilitated dialogue with Summit participants.

Advanced Ceramics for Sustainability - View from Siemens Corporate Technology


Wolfgang Rossner

Predicted megatrends like climate change, population growth, demographic change and scarcity of resources require more sustainable global development. Sustainability is not only a highly demanded property, but it is also a powerful innovation driver for technologies. Within this context advanced materials are expected to provide new solutions for the environment, the economy and society. Advanced ceramics can contribute to achieving higher sustainability by improving the efficiency, functionality and lifetime of technical systems. Stimulated by their multidisciplinary character, ceramic materials can open options for new solutions in power generation, energy saving and energy storage, or self-adapting components using more 'intelligent' materials.

Speaker: Wolfgang Rossner, Technology Leader Ceramics, Siemens AG Corporate Technology

Emerging Applications and Challenges in Using Ceramics at General Electric


Krishan L. Luthra

Ceramics play a critical role in the performance of many energy systems, including gas turbines, batteries and SOFCs. Ceramic matrix composites can lead to improved performance of gas turbines, both for land-based and aircraft engines, because of their lighter weight and higher temperature capability. Key components of SOFCs are ceramics, such as the yttria-stabilized zirconia electrolyte and the perovskite cathode. High-energy-density sodium metal halide battery is another emerging application, relying on a beta alumina electrolyte and other ceramics. Key challenges in commercializing these applications are component life and cost. This presentation will discuss applications and challenges in the use of ceramics in these three applications, focusing on CMCs.

Speaker: Krishan L. Luthra, Technology Leader, Ceramics & Metallurgy, GE Global Research

TUESDAY, AUG. 2, 2011

GENERAL SESSION 2 1:30 TO 3:15 P.M.

Entrepreneurial Case Studies

Start-up businesses are an integral part of the ceramic and glass materials community. Many entrepreneurs have started with a research focus and successfully transitioned into launching/managing a business. Three tech-savvy leaders will provide case studies on building businesses, followed by a facilitated panel discussion.

Bart Riley

Case Study I

Founded in 2001, A123 Systems has developed a revolutionary new Li-ion cell technology based on a novel nanophosphate™ chemistry. By selecting a material with intrinsic safety and stability, A123 Systems worked with MIT to create a nanoscale cathode material with high intrinsic power density. Subsequent work at A123 Systems resulted in the development and commercialization of a new class of Li-ion cell products that were ideally suited for high power applications such as power tools, hybrid electro vehicles and certain grid storage applications.

Speaker: Bart Riley, CTO, Co-founder, A123 Systems

Ted Day

Case Study 2

MO-SCI Corporation was started in 1985 as a spin-off from Missouri University of Science and Technology. Throughout its history, MO-SCI has been handed many challenges that small companies normally face and has weathered them well. After 26 years in business, it has grown into a world recognized small business serving the majority of the Fortune 500 on a sole supplier basis. MO-SCI's unique business philosophy–using partnering as its main focus in business relationships–has served the company well. MO-SCI now serves over 1500 customers in 50 countries worldwide.

Speaker: Ted Day, President, MO-SCI Corporation

Marina Pascucci

Case Study 3

CeraNova is a privately held company that was founded in 1992 as a developer and manufacturer of ceramic superconductors. Since then, the company has grown into a leading innovator of ceramic processing solutions and engineered components for high technology systems. Today CeraNova's major focus is on fine-grained, transparent ceramics (monolithic, composite and fibers) that are essential for an increasing number of military, industrial and commercial products. CeraNova's experienced staff and well-equipped facility make it well positioned to provide contract technology development and small-scale manufacturing when it may not be economically viable internally at other firms.

Speaker: Marina Pascucci, President, CeraNova Corporation

GENERAL SESSION 3 3:45 TO 5:15 P.M.

Business Opportunities and Strategies in Emerging Markets

This session showcases two real-world case studies from business development leaders at two ceramics-related companies. Each case study will be followed by a facilitated dialog with CLS participants.

Case Study I: A Small U.S. Company's Approach to China

Thomas A. Cole

It's a challenge for a $20M revenue company to expand into China. This case study summarizes the five-year effort of Minco, Inc. before it was purchased by Ceradyne, Inc. in 2007. Minco produced fused silica with a proprietary process and also had proprietary products used in the precision investment casting industry that were quite advanced compared to the Chinese practices at the time. The study details how classes, books and consultants were used to prepare and execute the plan of finding a Chinese partner, structuring and financing the enterprise, beginning sales, and building a plant.

Speaker: Thomas A. Cole, VP of Business Development, Ceradyne, Inc.

Case Study 2: Exploring Emerging Markets and the Advanced Materials Industry

Donald J. Bray

There are several emerging markets where advanced materials will play a significant role. Bray will describe the analysis and approach that a larger, diversified materials company is taking to capitalize on these new markets – energy production (solar and wind), energy storage, energy conservation, soldier survivability, and electronics.

Speaker: Donald J. Bray, Business Director, NP Aerospace, Inc. (a Morgan Crucible Company)

CLS 2011 features three concurrent tracks: **Energy Innovations**, **Business of Ceramics** and **Innovative Applications for Ceramic Materials**. Leaders from a variety of organizations will discuss important business opportunities and critical technological challenges in the ceramics and glass materials community.

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WEDNESDAY, AUG. 3, 2011

8:30 – 9:25 A.M.


Kevin S. Jones

Energy Track: Advances in Solid-State Batteries

The solid-state battery market is currently around $50M or 1% of the total Li-ion battery (LIB) market. Without changes in the cost of manufacturing or the materials used, it is difficult to envision the solid-state battery market exceeding $500M. Recently, a new method of inexpensive, non-vacuum electroless deposition has been developed by Planar Energy to fabricate solid-state batteries using a roll-to-roll approach. This process has been combined with a new solid thio-LISICON electrolyte and novel approaches to the cathode and anode to produce solid-state batteries with greatly increased capacity. These recent developments offer the potential development of low cost solid-state LIBs for use in electric drive vehicles (EDVs). This presentation will review solid-state LIB technology from the first viable micro-batteries to the current technology being developed for use in EDVs and future applications.

Speaker: Kevin S. Jones, Professor MSE, University of Florida, Co-Director, Software & Analysis of Advanced Materials Processing Center and Collaborator with Planar Energy


Thomas Abraham

Business Track: Emerging Nanomaterials and Nanotechnology Applications, Industry Trends and Current and Future Markets

With large-scale current and potential use of nanostructured materials in applications, such as chemical mechanical polishing, magnetic recording and ferro fluids, sunscreens, catalysts, biodetection/labeling, cancer treatment, imaging, conductive coatings, optical fibers, FEDs, chips and nanocomposites, the nanotechnology industry is taking off with commercial markets. This presentation will provide an overview of the markets for nanomaterials and nanotechnology segments, such as nanoelectronics, nanophotonics, nanomagnetics, nanopatterning and lithography, nanomedicine, nano-enabled packaging, energy generation, and storage devices.

Speaker: Thomas Abraham, President, Innovative Research and Products, Inc.

Applications Track: Ultrahigh Temperature Ceramics for Extreme Environmental Applications


Sylvia M. Johnson

Ultrahigh temperature ceramics, which include the diborides of hafnium and zirconium have seen a resurgence in research and development interest. There is particular interest in these materials for aerospace applications especially leading edges for entry vehicles. Theses materials are refractory and have attractive thermal properties; however, they are brittle and oxidize. Efforts to improve these properties are underway in many institutions. This talk will give some background on these materials and describe the application. The majority of the presentation will discuss progress being made towards improving the mechanical and oxidation-resistance properties.

Speaker: Sylvia M. Johnson, Chief Materials Technologist, Entry Vehicle and Systems Division, NASA Ames Research Center

YOUNG PROFESSIONAL PROGRAM

Know individuals at your company, institution or university who are rising stars? Nominate them to be part of the **Future Leaders Program**. With input from executives, R&D leaders, researchers, engineers and academicians, this program is designed to help high-performing young professionals gain a fuller understanding of their leadership abilities, including their strengths and development areas within the materials science world. YPs may qualify for a special rate.

Contact Megan Bricker at **mbricker@ceramics.org** for special pricing information and to nominate a young professional.

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WEDNESDAY, AUG. 3, 2011

9:30 – 10:25 A.M.

John Olenick

Energy Track: Ceramic Components for Fuel Cells and Other Energy Applications

Since 1960, the planet has changed due to increasing levels of carbon dioxide in the atmosphere. Similar increases over the next 50 years will reach a level beyond that which is comfortable for all species. At the same time, the global demand for energy, water and food will soar. Today's commercialization efforts of fuel cell technology and other advanced energy methods can be an important piece of the overall solution to provide more clean energy. Ceramic components are becoming increasingly important in the cleantech market space providing means for ion transport, thermal management, catalysis of gases and liquids, power generation, energy storage, hydrogen purification and storage generation of light, and energy from waste processes.

Speaker: John Olenick, CEO and President, ENrG Incorporated

Mark Patterson

Business Track: Raw Materials Trends Impacting the Ceramics and Glass Community

We currently live in a technologically rich culture where the existence and operation of reliable infrastructure and devices is, for the most part, taken for granted. With what might be considered as the reluctant acceptance of climate change and the effect our species is having on our own environment, society has become aware of the need for sustainable solutions to the choices we make and the industries we support. Many raw materials necessary to support our critical technologies are imported and so there exists a risk as to their long-term supply and availability. Current initiatives to ensure supply chain security and how technology might better be used to deliver a sustainable tomorrow will be discussed.

Speaker: Mark Patterson, Director Research Initiatives, College of Engineering, University of Arizona

Steve Jung

Applications Track: Bioengineering Soft Tissue with Ceramics

For much of the last 40 years, a hydroxyapatite-based material or a bioactive glass that formed hydroxyapatite in-vivo was thought to be the ideal material for an orthopedic implant. Forming an appropriate end material in-vitro or in-vivo and the material's ability to stimulate bone cells were the main areas of study. A new way of looking at regenerative materials is not just focusing on bone specific criteria, but also understanding the role soft tissue plays in the healing process. Connective tissue heals in a similar fashion; therefore, understanding how to stimulate soft tissue growth (i.e. angiogenesis) with implant materials can be used to enhance healing in both hard and soft tissue applications.

Speaker: Steve Jung, Senior Research & Development Engineer, MO-SCI Corporation

10:45 – 11:40 A.M.

Energy Track: Solar Energy Developments

The conversion of solar power to electricity can take place by photovoltaic (PV) or solar cells, as well as by use of solar power plants. This session will explore new developments in solar energy technology. Check www.ceramics.org/cls2011 for an updated description of this session.

Speaker: Coming Soon

WEDNESDAY, AUG. 3, 2011

10:45 – 11:40 A.M.

Kevin See

Business Track: The Market Outlook for Energy-Related Technologies

Emerging markets provide great opportunity for materials' suppliers and researchers, as they spur the growth of new supply chains for novel applications. Here we review the drivers creating opportunities for ceramic materials in several areas, including electric vehicles, advanced coatings and composites, and water treatment. The presentation will sort through the hype surrounding these markets, examine trends in each of these areas and discuss the economic, regulatory, and technical factors that affect adoption now and in the future.

Speaker: Kevin See, Analyst, Lux Research

Louis Mattos Jr.

Applications Track: Advances in Glass Strength and the Impact on Society

Glass is prized for its ability to transmit light, be formed into miraculous shapes and resist chemical corrosion. Today's commercial glass fails to tap 99.5% of its theoretical strength and has one major flaw—it breaks. The vision of the Usable Glass Strength Coalition is to bridge the gap between the lab strength of glass and the usable commercial strength of glass, enabling dramatic innovations in design and sustainability. The presentation will discuss the challenge of forming a pre-competitive research coalition of industry, university and government agencies to support a fundamental research agenda to improve usable glass strength.

Speaker: Louis Mattos Jr., Senior Scientist, The Coca-Cola Company

1:00 – 1:55 P.M.

Terry Michalske

Energy Track: Small Modular Nuclear Reactors

The small modular reactor concept is changing paradigms in nuclear power by providing small, grid-appropriate reactors with enhanced features, including passive safety controls. Additionally, SMRs are generally shop-fabricated, greatly reducing capital costs and opening new opportunities in the manufacturing sector, including materials manufacturing. The presentation will discuss these opportunities and cover recent SMR developments.

Speaker: Terry Michalske, Laboratory Director, Savannah River National Laboratory

1:00 – 2:55 P.M.

Business Track: Business Valuation

Allen Oppenheimer

Business owners and entrepreneurs will get practical tools and learn how to package their business to make it attractive to a buyer; how to maximize the future potential of the business; how to increase sales through Marketing/Market Research; organizational planning; how to substantiate goodwill; and more. In addition, the step-by-step process will cover practical aspects of the sale-of-business process; how to transfer a business to family and employees using an ESOP; how to target and attract suitable buyers; how to negotiate an increase in price on the basis of favorable deal structuring; and practical examples on the sale-of-business process.

Speaker: Allen Oppenheimer, President, A.M. Oppenheimer, Inc.

1:00 – 1:55 P.M.

Applications Track: Ceramic Applications in the Automotive Industry

Michael J. Hoffmann

Ceramic materials are widely used in the automotive industry as structural or functional components, such as pump seals, catalyst supports, particulate filters, spark plugs, sensors or piezoelectric actuators. Other ceramic parts have been developed but never used in mass production, due to high costs, insufficient reliability or only minor benefits to system performance. To open new markets for ceramic components, feasibility studies and prototypes are required to demonstrate the potential of an enhanced efficiency. The presentation will cover potential uses of engineering ceramics for local strengthening of light-weight metal parts with porous ceramic preforms, or corrosive and tribologically highly stressed pump components. The current status of piezoelectric actuators for fuel injection systems and PTC heaters, as well as the challenges for alternative materials to lead containing compounds will also be discussed.

Speaker: Michael J. Hoffmann, Professor and Head of the Institute of Ceramics for Mechanical Engineering, Karlsruhe Institute of Technology

WEDNESDAY, AUG. 3, 2011

2:00 TO 2:55 P.M.


Mark Verbrugge

Energy Track: Material Needs in Alternative & Renewable Energy for the Automotive Industry

Great progress has been made in recent years relative to battery technology. Primary concerns associated with lithium ion batteries and high-volume traction applications are associated with cost, life (cycle and calendar), and performance over a wide temperature range. Despite these concerns, it is well recognized that soon lithium ion batteries will be used in a variety of electrified vehicles, spanning from engine start/stop applications to hybrid electric vehicles to pure electric vehicles. Hence, it is critically important to understand phenomena governing the durability of lithium ion cells within the context of traction applications and to identify improved electrode materials. The presentation will focus on (1) the combined mechanical and chemical degradation of lithium ion electrode materials, including both recent theoretical and experimental methods to clarify the governing phenomena, (2) new materials offering promising high energy/high power applications, and (3) how global energy challenges, trends in personal transportation, and electrochemical energy storage technologies relate.

Speaker: Mark Verbrugge, Director, Chemical Sciences and Materials Systems Lab, General Motors Research & Development Center


Michael Hill

Business Track: Raw Material Scarcity and its Impact on the U.S. Advanced Ceramic Technological Development, An Industrial Perspective

Raw material considerations play a considerable role in the engineering activities of many U.S. corporations manufacturing ceramic products. Such considerations play a central role in the technology development roadmaps and how they are implemented. The impact of current raw materials scarcity issues, such as indium and the rare earth elements are central considerations for a number of advanced technology applications. Data will be presented that can serve as a predictive model for the supply and demand for various raw materials in the 5-30 year timeframe. Various approaches taken by industries and governments around the world to address these issues will be reviewed. Finally, proactive strategies will be discussed on handling scarcity issues with an emphasis on aligning research and development activities to address current and potential future issues involving the supply of critical raw materials.

Speaker: Michael Hill, Technical Director, Research and Development, Trans-Tech, Inc.

CLOSING GENERAL SESSION 3:15 TO 5:00 P.M.

Connecting Research, Technology and Manufacturing

Research and innovation are critical to development of technology that can transform the world. This session features presentations from two leaders from organizations within the United States and Europe that help connect research, technology and manufacturing. Each presentation will be followed by a facilitated dialog with Summit participants.

Case Study I


Thomas W. Peterson

The National Science Foundation is the primary source of support for basic research and education in science and engineering throughout the US academic community. At NSF, the Directorate for Engineering has historically occupied a unique and interesting space within the Foundation, and today is no different. Like other directorates, most of ENG investments support basic research and discovery. But a portion of the ENG portfolio of investments directly addresses the important translation of the fruits of successful basic research into products and processes of societal benefit. What can one federal agency (the NSF) reasonably do to stimulate innovation and economic development through strategic investments in our nation's colleges and universities?

Speaker: Thomas W. Peterson, Assistant Director for Engineering, National Science Foundation

Case Study 2


Alexander Michaelis

Advanced ceramics have enormous potential for high-tech markets, such as energy and environmental technology. Several case studies of Fraunhofer projects and of industrial partners will show how technology transfer can be expedited within the Fraunhofer model. One important feature of those projects is that R&D is done along the whole value chain, including not only proof of principle up to prototyping but also up-scaling to pre-series production. This approach leads to shorter time to market and reduces risks, such as retentivity costs. As examples, fuel cell storage and filtration applications will be covered.

Speaker: Alexander Michaelis, Director, Fraunhofer Institute for Ceramic Technologies and Systems

REGISTRATION INFORMATION

	SUPER EARLY BIRD ON/BEFORE MAY 16, 2011	ON/BEFORE JULY 1, 2011	AFTER JULY 1, 2011
ACerS Member	❑ $495	❑ $595	❑ $720
ACerS Member with Membership Renewal	❑ $615	❑ $715	❑ $840
Nonmember *(includes one year of ACerS Membership)*	❑ $615	❑ $715	❑ $840
ACerS Emeritus/Senior Member	❑ $395	❑ $495	❑ $620
Material Advantage Student Member		❑ $135	❑ $210
Student: Not in Material Advantage		❑ $175	❑ $250
Extra Dinner Ticket		❑ $80	❑ $80

Registration includes 2 lunches, coffee breaks, the networking reception and the conference dinner on Tuesday.

To register, visit www.ceramics.org/cls2011 or contact Customer Service by phone (866) 721-3322 in U.S. or (240) 646-7054 outside U.S., by fax (301) 206-9789, or by email customerservice@ceramics.org.

Save 15% off each registration when 3 or more people from the same organization sign up from May 17 through July 1 at the Member, Nonmember, or Emeritus rates. Registrations must be made at the same time, but Registrants may be from different locations. To take advantage of this offer, contact ACerS Customer Service.

HOTEL INFORMATION

Hyatt Regency Baltimore

300 Light Street
Baltimore, MD 21202
(402) 592-6464 | (888) 421-1442

Room Rates

$199.00 plus tax - Single/Double/Triple/Quad
$161.00 plus tax - Government (Access code: ACSGOV0711)

Cut-off Date: July 8, 2011

Make reservations online at www.ceramics.org/cls2011.

When making a reservation by phone, mention The American Ceramic Society room block to secure your reservation at the conference rate.