

# 1<sup>st</sup> ENGINEERED FINE PARTICLE APPLICATIONS Conference

**May 23 - 25, 2005**

Marriott Boston Cambridge Hotel  
Cambridge, Massachusetts

sponsored by

**Information  
Management Institute, Inc.  
Materials Technology  
Division**



## CONFERENCE FOCUS

IMI Materials Technology Division's **1<sup>st</sup> Engineered Fine Particle Applications Conference** is the first conference dedicated to exploring the technology developments, market needs and opportunities for engineered fine particles. The development and continued commercialization of improved manufacturing, processing and integration techniques for engineered fine particles will foster rapid growth of economically viable products in energy, electronics, consumer products and numerous other industries.

This first of its kind conference will explore the latest advances in commercialization and applications of engineered fine particles. Experts from industry, government, academia and investment community will present current market trends and opportunities and provide key insights into the future trends and challenges. While nanotechnology is forecast to have extensive potential long term benefits, the near term markets for true nano-sized particles are difficult to define and relatively limited with the business impact of many technical, regulatory and health issues still unclear. On the contrary, **rapidly growing commercial applications for engineered fine particles exist today in electronics, personal care, energy, pharmaceutical, and other markets.**

The IMI Materials Technology Division's **1<sup>st</sup> Engineered Fine Particle Applications Conference**, the first of its kind, will be a worldwide meeting place for who's who in the rapidly evolving engineered fine particles field; a field which will change the design, manufacture and functionality of many products in the years to come. It will allow presenters, attendees and exhibitors to meet, learn and promote their technologies, vision, products and services. The conference will be a meeting place for particle producers, equipment developers, materials developers, processing experts and end users, i.e. all industry sectors with commercial interest in the advancement of engineered fine particle technology in the global economy. Engineered fine particle producers, equipment and system providers and end users will jointly address the challenges and opportunities associated with implementation of engineered fine particles into new applications and the need to innovate commercially viable solutions. Conference presentations will also address production and processing technologies; R&D and commercialization of emerging applications, markets and implementation issues.

## CONFERENCE CHAIRMAN

Miodrag Oljaca, Cabot Corporation

## CONFERENCE SPEAKERS

Lawrence Bock, Nanosys  
Dr. Karen J. Buechler, ALD NanoSolutions  
Clinton W. Bybee, Arch Venture Partners\*  
Dr. Scott Cumberland, Clorox  
Dr. Jeffrey T. Depinto, Air Products & Chemicals  
Jon DiLoretto, American Chemical Council  
Dr. Emory A. Ford, Materials Technology Institute  
Dr. Guoyi Fu, Millennium Chemical  
George Ghenciu, Nantero  
Dr. Rajeev Gorowara, DuPont  
Dr. Daniel A. Green, DuPont  
Tim Harper, CMP Cientifica  
Dr. Amit M. Kulkarni, GE Global Research  
Matthew M. Nordan, Lux Research  
Dr. James S. Murday, Naval Research Lab  
Dr. Balakrishnan G. Nair, Ceramatec  
Dr. Matthew Neville, Consultant\*  
Søren Pehrson, Haldor Topsøe A/S  
Geoffrey Varga, Degussa  
Dr. Friedrich von Gottberg, Cabot Corp.  
Dr. Charles F. Zukoski, Univ. of Illinois\*

\* Session Chair



Materials Technology Division

# 1st Engineered Fine Particle Applications Conference

Marriott Boston Cambridge Hotel  
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**May 23-25, 2005**

## Monday, May 23, 2005

11:00 a.m. – 1:30 p.m. Registration

1:30 p.m. Opening Session

### MARKETS & TRENDS

#### WELCOME AND INTRODUCTIONS

Alvin G. Keene, President, Information Management Institute, Inc., Carrabassett Valley, Maine

Conference Chairman: Miodrag Oljaca, Technology Application Manager, Cabot Corporation, Albuquerque, New Mexico

Session Chair: Clinton W. Bybee, Managing Director, Arch Venture Partners, Austin, Texas

#### WHILE THERE IS PLENTY OF ROOM AT THE BOTTOM, WILL NANOTECHNOLOGY INVESTMENTS WIND UP AT THE TOP?

Clinton W. Bybee, Managing Director, Arch Venture Partners, Austin, Texas

- Trends In Nanotechnology
- Where The Venture Capital Investments Are Going
- Trends In The Patent Landscape
- Unmet Challenges For Commercial Markets
- Future Frontiers With Promise

#### FINE PARTICLES: THEIR ROLE IN NATIONAL NANOTECHNOLOGY INITIATIVE

Dr. James S. Murday, Head, Chemistry Division, Naval Research Laboratory & Executive Secretary, NSTC Nanoscale Science, Engineering and Technology Subcommittee, Washington, DC

- National Nanotechnology Initiative (NNI): Seeking To Exploit Scientific & Technological Opportunities Associated With Behavior Of Nanostructures
- U.S. Status In Global Efforts
- Roles For Nano (Fine) Particles In NNI With Special Attention To DOD & Navy Programs
- Applications Emerging In Commercial Marketplace

#### NANOTECHNOLOGY AT AIR PRODUCTS: STRATEGY DEVELOPMENT & THE ROLE OF PARTNERSHIPS

Dr. Jeffrey T. Depinto, Business Development Manager, Air Products and Chemicals, Inc., Allentown, Pennsylvania

- Developing A Strategy Around Nanotechnology
- Products, Services & Solutions: Atmospheric Gases, Process & Specialty Gases, Performance Materials & Chemical Intermediates
- Unique Nanomaterial Applications in Technology, Energy, Healthcare & Industrial Markets
- Role Of External Partnerships

#### NANOMATERIALS BY DESIGN

Dr. Emory A. Ford, Associate Director, Materials Technology Institute, Member of Vision 2020 Steering Team, Florence, Massachusetts

- Vision 2020's Roadmap For Nanomaterials In Chemical Industry
- Nanomaterials Produced By & Used In Chemical Industry
- Alternative Nanomaterial Design & Production Strategy
- Target Applications
- Research Topics
- Implementation Plan

#### PARTICLES AT THE NANOSCALE: THREATS & OPPORTUNITIES

Tim Harper, Founder & President, CMP Cientifica, Madrid, Spain

- Engineered Fine Particles Can Be Produced With Unprecedented Degree Of Control BUT Implications of Their Release Causes Concern
- Toxicological Studies? How Much We Don't Know
- Policy Responses To Emerging Technologies: From UK Royal Society To European Commission & FDA
- Public Attitudes: How To Avoid Repeat Of GMO Fiasco?
- Assessing Future Liabilities: Why The Lawyers Are Already Circling
- Opportunities & Growth Trends For Engineered Particles

5:30 p.m. Reception

## Tuesday, May 24, 2005

7:00 a.m. Continental Breakfast

8:00 a.m. Session 2

### PARTICLES & PROCESSING TECHNOLOGIES

Session Chair: Dr. Charles F. Zukoski, Vice Chancellor of Research, University of Illinois @ Urbana-Champaign, Champaign, Illinois

#### PRODUCTION & PROCESSING TECHNOLOGY INNOVATIONS NEEDED FOR NEW PARTICLE-BASED APPLICATIONS DEVELOPMENT

Dr. Charles F. Zukoski, Vice Chancellor of Research, University of Illinois @ Urbana-Champaign, Champaign, Illinois

- Manufacture Of Fumed Products Tuned To Alter Particle Structure & Surface Chemistry
- Importance and Relative Roles Of Structure & Surface Chemistry In Controlling Mechanical Properties In Application Performance
- Effects Of Particle Structure On Flow Properties Of "Hard" Fumed Silica Particles
- Research Findings:
  - Structure Primarily Alters Maximum Packing Fraction
  - Fumed Particle Structure Plays A Key Role In Setting The Maximum Mass Loading Of A Suspension
  - Unique Thixotropic & Yielding Properties Of Fumed Particle Suspensions Are Related To Surface Properties – Not Their Structure

#### SATISFYING CUSTOMER NEEDS THROUGH FINE PARTICLE DESIGN

Dr. Friedrich von Gottberg, Vice President & Director of R&D, Cabot Corporation, Billerica, Massachusetts

- Fine Particles Commonly Used In Compound Materials To Achieve Specific Material Property
- Commercially Successful Fine Particles Must Satisfy Needs At Acceptable Cost By
  - Understanding Required Functionality & Providing It Within Constraints Imposed By The Composite
  - Produce Particles From Different Materials
  - Control Structure Of Particles
  - Understand & Have Ability To Modify Particle Surfaces
  - Design Particles For Composites That Achieve Desired Material Properties
- Examples
- Perspective On What Is Required To Go From Idea To A Material To A Successful Business

### Luncheon Speaker Tuesday, May 24, 2005

#### NANOTECH MYTH & REALITY: THE REAL OPPORTUNITIES

Matthew M. Nordan, Vice President of Research, Lux Research, New York, New York

- What's Special About >100 Nanometers: Quantum Properties Overtake Bulk Properties
- Nanotechnology Commercialization Is Approaching A Broad-Ranging Transformation: A Phase Change
- Nanotechnology Investment & Venture Capital Funding
- Myths Of Conventional Wisdom About Nanotechnology
  - The Nanotechnology Value Chain
  - Nanotechnology Product Status
  - Global Forecasts & Deployment Expectations
  - How To Capture Value Through Nanotechnology

To Register Online

Visit IMI Web Site

[www.imi-materialstechnology.com](http://www.imi-materialstechnology.com)

## NEW PRODUCT DEVELOPMENT FOR ENGINEERED FINE PARTICLE SYSTEMS AND SOLUTIONS

Geoffrey Varga, Director, Degussa Advanced Nanomaterials, Hanau, Germany

- Strategic R&D For High-Temperature Gas-Phase Synthesis Of Fine Particles
- Post-Processing, Modification & Dispersion/ Formulations Of Fine Particles To Address Specific Application Opportunities

## COMMERCIALIZING HIGH PERFORMANCE INTEGRATED INORGANIC NANOSTRUCTURES

Lawrence Bock, Executive Chairman of the Board, Nanosys Inc., Palo Alto, California

- Developing High Performance, integrated Inorganic Semiconductor Nanodevices For High Value Applications: Information Technology, Microelectronics, Communications, Renewable Energy, Defense & Life Sciences
- Nanosys' Broad Technology Platform: More Than 350 Patents & Patent Applications
- Partnering With Industrial Leaders Like: Intel, Matsushita Electric Works, Sharp, Dupont & SAIC

## NANOPARTICLES TECHNOLOGY AT GE GLOBAL RESEARCH

Dr. Amit M. Kulkarni, Chemical Engineer, GE Global Research Center, Chemical Nanotechnology Laboratory, Niskayuna, New York

- GE Nanotechnology Advanced Technology Program
- Development Of Technologies For Applications
  - Healthcare
  - Advanced Materials
  - Security
  - Others

12:00 Noon Luncheon & Presentation

## NANOTECH MYTH & REALITY: THE REAL OPPORTUNITIES

Matthew M. Nordan, Vice President of Research, Lux Research, New York, New York

1:30 p.m. Session 3

### COMMERCIAL SUCCESSES

**Session Chair:** Dr. Matthew Neville, Consultant & Former CEO of Cabot Microelectronics Corporation, Geneva, Illinois

## EVOLUTION OF FINE ENGINEERED PARTICLES FROM PIGMENTS TO CMP

Dr. Matthew Neville, Consultant & Former CEO of Cabot Microelectronics Corporation, Geneva, Illinois

- Range Of Commercial Fine Particles & Market Applications
- Critical Integration Of Particle: Surface, Media & Market Requirements
- Example: Development & Evolution Of CMP: Technology & Markets
- Future Trends In Semiconductor Technology

## FINE PARTICLES: THEIR ROLE IN CATALYSIS

Søren Pehrson, Research Engineer, Haldor Topsøe A/S, Lyngby, Denmark

- Important properties
- Characterization methods

## STRUCTURE AND POROSITY ENGINEERING OF FINE PARTICLES FOR CATALYST APPLICATIONS

Dr. Guoyi Fu, Senior Research Chemist, Research Center-Baltimore, Millennium Chemical, Glen Burnie, Maryland

- Particle Structures: Some Are Simple & Others Are Complex
- Structure Control & Engineering During Particle Formation Are Important For Performance Optimization
- Crucial Properties For High Product Performance
  - Particle Size & Geometry Control
  - Pore Size & Structure Engineering
  - Nanoparticle Stabilization
  - Surface Modification
- Correlation Of Micro-structural Characteristics With Performance In Practical Applications

## ENGINEERING FINE PARTICLE PERFORMANCE

Dr. Daniel A. Green, Research Associate, and Dr. Rajeev Gorowara, Senior Consulting Engineer, DuPont Particle Science and Technology Group (PARSAT), Wilmington, Delaware

- Opportunities & Trends
  - Tightening Performance Requirements
  - The Move To Nanometer Scale
  - Functionalization
- Key Issues In Production Of Engineered Fine Particles
- DuPont Capabilities In Development Of Engineered Fine Particles
- Discussion Of R&D Needs

**SUPPLIERS' FORUM:** 5-Minute Presentations Related To Engineered Fine Particle Technology and Applications, Product or Service Capabilities. The Suppliers' Forum is open to all Conference Registrants

6:30 p.m. Reception

**Wednesday, May 25, 2005**

7:00 a.m. Continental Breakfast

8:00 a.m. Session 4

### DEVELOPMENT, COMMERCIALIZATION & IMPLEMENTATION ISSUES

**Session Chair:** Miodrag Oljaca, Technology Application Manager, Cabot Corporation, Albuquerque, New Mexico

## ENGINEERED FINE PARTICLES IN ENERGY, ENVIRONMENTAL & COMMUNICATIONS APPLICATIONS

Dr. Balakrishnan G. Nair, Program Manager, New Business Development Ceramatec, Inc., Salt Lake City, Utah

- Ceramatec & It's Interest In Fine Ceramic Particles
- Opportunities For Fine Ceramic Powders In:
  - Solid Oxide Fuel Cells & Other Solid State Electrochemical Devices
  - Fiber Optics & Infra-red Windows
  - Thermal Insulation
  - Mobile & Stationary Source Emissions Reduction
  - Gas Separation Membranes

## PARTICLE FUNCTIONALIZATION TECHNOLOGIES AS A CATALYST IN COMMERCIALIZING NANOMATERIALS

Dr. Karen J. Buechler, President, CTO and co-Founder, ALD NanoSolutions, Inc., Broomfield, Colorado

- Commercialization Of Novel Nanomaterials: Past, Present & Future
- Particle-ALD™: A Material Functionalization Technology Platform
- Product/Market Rationale For Particle ALD™: Near & Long Term
- Particle ALD™ Applications: BN Thermal Filler Particles & Stable Magnetic Materials For Medical Imaging Contrast Agents

## FINE PARTICLE DEVELOPMENTS FOR CONSUMER PRODUCTS

Dr. Scott Cumberland, Senior Scientist, Emerging Technologies Group, Clorox, Pleasanton, California

- Who Is Clorox: Product Portfolio & Focus On Innovation
- Why Is Clorox Interested In Fine Particles?
  - New Applications For Fine Particles For Consumer Products: Commercialized Products & Application Patents
  - Clorox Products Match Well With Fine Particle Properties: Examples Of Disinfection, Cleaning & Auto Products
- How Will Clorox Commercialize Products Containing Fine Particles?
- Partnership Model To Build Capability
  - Partnership Is A Strategy At Clorox
  - Best-In-Class Partnership Process Drives Collaboration For Mutual Wins
- Develop Products Process To Drive Commercialization
  - Process In Place To Drive Technologies Through Commercialization
  - Close Ties To Consumer Insights

## STEWARDSHIP OF THE PRODUCTS OF NANOTECHNOLOGY

Jon DiLoretto, American Chemical Council, Arlington, Virginia

- Many Companies Have Conducted Nanomaterials Research & Moved Products From The Lab Bench To The Marketplace
- These Products May Have An Impact On Occupational Health & Safety In Addition To Potential Environmental Impacts
- Product Stewardship's Position As Part Of Industry's Efforts To Understand Any Potential Risks Along The Value Chain For These Products

## NANTERO'S CNT-SOLUTION: ENABLING CARBON NANOTUBE-BASED PRODUCTS

Dr. George Ghenciu, Senior Chemical Engineer, Nantero, Inc., Woburn, Massachusetts

- Applications Of Carbon Nanotubes
- Materials Requirements Of The Microelectronics Industry
- Status Of Conventional Nanotube Solutions
- Nantero's Accomplishments To Satisfy Microelectronics Industry Requirements
- Use Of Nantero's CMOS-Grade Carbon Nanotube Solution In DUV Production Fabs
- Scale-Up Of CMOS-Grade Carbon Nanotube Solution Production Together With Brewer Science & Product Offerings

12:30 p.m. Adjournment

### EXHIBIT OPPORTUNITY – FREE DISPLAYS

Product demonstrations/displays are COMPLIMENTARY for both conference speakers and registrants. Contact Al Keene [al@imiconf.com](mailto:al@imiconf.com) at IMI for more information.

## REGISTRATION INFORMATION

Registration Fee: \$1095 per registrant  
\$995 for each additional registrant from same company to  
the conference when registered as a group.

The registration fee includes attendance at all conference sessions, two continental breakfasts, one lunch, two receptions, coffee breaks, the conference reference binder and CD-ROM.

Cancellations will receive a 100% refund if made 72 hours prior to the start of the program. Substitutions may be made at any time. Cancellations made less than 72 hours prior to the start of the conference will be charged a \$300 cancellation fee, but will receive a copy of the complete conference binder/CD.

To register for IMI's **1<sup>st</sup> Engineered Fine Particle Applications Conference**, submit the registration form with payment to Susan Meldrum, Conference Administrator, Information Management Institute, Inc., 1106 Valley Crossing, Carrabassett Valley, ME 04947 USA. You may reserve space by calling +1-207-235-2225, sending a fax to +1-207-235-2226 or by sending an email message to [imi@imiconf.com](mailto:imi@imiconf.com) or register online on our web sites [www.imi-materialstechnology.com](http://www.imi-materialstechnology.com) or [www.imiconf.com](http://www.imiconf.com)



## REGISTRATION FORM

### **1<sup>st</sup> Engineered Fine Particle Applications Conference**

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Cambridge, Massachusetts  
May 23-25, 2005

NAME \_\_\_\_\_

JOB TITLE \_\_\_\_\_

COMPANY \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ STATE \_\_\_\_\_ ZIP \_\_\_\_\_

COUNTRY \_\_\_\_\_

PHONE \_\_\_\_\_ FAX: \_\_\_\_\_

EMAIL \_\_\_\_\_

All checks should be in U.S. dollars drawn on a U.S. bank and made payable to Information Management Institute, Inc. An invoice with bank transfer details for IMI's U.S. or European bank account will be provided upon request.

Register Online at  
[www.imi-materialstechnology.com](http://www.imi-materialstechnology.com) or [www.imiconf.com](http://www.imiconf.com)

## HOTEL RESERVATIONS

The **1<sup>st</sup> Engineered Fine Particle Applications Conference** is being held at the Marriott Boston Cambridge Hotel located in Cambridge, Massachusetts. Hotel reservations are the responsibility of each conference registrant. To receive the special meeting rate of \$189 for single or double occupancy, you must identify yourself as a registrant to the **IMI's 1<sup>st</sup> Engineered Fine Particle Applications Conference**. **Early booking is advised** as the reduced rate is guaranteed only until May 8, 2005. Phone Marriott Reservations at +1-800-228-9290 +1-617-494-6600 to make hotel reservations.

The Marriott Boston Cambridge Hotel is a convenient cab ride (5 miles/15 minutes) from Boston's Logan International Airport for approximately \$30. Valet parking is available for \$24.00 nightly self parking facilities are available adjacent to the hotel for \$18.00 per night. The Marriott Boston Cambridge Hotel address is:

Marriott Boston Cambridge Hotel  
Two Cambridge Center  
(Corner of Broadway and Third Streets)  
Cambridge, Massachusetts 02142  
Phone: +1-617-494-6600  
Fax: +1-617-494-6565  
Web Site: [www.marriottcambridge.com](http://www.marriottcambridge.com)

Dress for the IMI Materials Technology Division's **1<sup>st</sup> Engineered Fine Particle Applications Conference** will be casual.

Information Management Institute, Inc.  
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Carrabassett Valley, ME 04947 USA