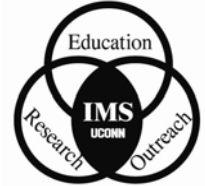




# University of Connecticut Institute of Materials Science



## IMS Associates Program Newsletter

Vol. 9, No. 2

August 2005

### Symposium Honoring Arthur McEvily, Professor Emeritus, Materials Science and Engineering

**Fatigue and Fracture of Traditional and Advanced Materials:  
A Symposium in Honor of Art McEvily's 80th Birthday**

**2006 TMS Annual Meeting  
San Antonio, TX  
March 12 -16, 2006**

The ASM/TMS Mechanical Behavior of Materials Committee are sponsoring a "Symposium in Honor of Art McEvily's 80th Birthday: Fatigue and Fracture of Traditional and Advanced Materials" to be held at 2006 TMS Annual Meeting in San Antonio, TX.

This symposium will honor the seminal contributions of Arthur J. McEvily to the theoretical and experimental aspects of fatigue and fracture over the last 50 years. His many contributions in the areas of fatigue crack growth and fracture have dealt with topics such as constitutive relations for fatigue crack growth; the effect of overloads, underloads and R ratio on fatigue crack growth; crack closure; variable amplitude loading; small fatigue crack growth; multi-axial loading; striation formation; and thermal and environmental effects.

The symposium will address recent advances and challenges in science and technologies related to fatigue and fracture of nanocrystalline materials, fine and coarse-grained alloys, amorphous materials, and their composites. Specific topics include, but are not limited to: mechanisms of fatigue crack initiation and small crack growth, large crack growth near the fatigue threshold and in the high  $\Delta K$  regime, crack closure, crack initiation and growth ahead of stress concentrations, fatigue life prediction, fatigue fracture, variable amplitude loading, overloads, multi-axial loading, fracture behavior, and environmental effects.

Professor McEvily is still active at IMS and continues to be a valuable resource person for the Associates Program.

#### Inside this issue:

<i>Focus on Research - Richard Parnas</i>	2
<i>Governor Rell Signs Nanotechnology Legislation</i>	3
<i>Seery New Director of Polymer Program</i>	3
<i>Golf Balls</i>	3
<i>Lei Zhu Awarded DuPont Young Professors Grant</i>	3
<i>New Instrumental Capability - SPEX Fluorolog 3</i>	4
<i>Recent Graduates of Materials Science &amp; Eng.</i>	4
<i>News from Materials Science &amp; Engineering</i>	5
<i>Selected Recent Theses from the Polymer Program</i>	5
<i>Suib Joins Elite Group of Chemical Pioneers</i>	6
<i>Incubator Helps Turn Scholarly Research Into Viable Business</i>	6
<i>GE Advanced Materials Establishes \$500,000 Scholarship</i>	6
<i>Department Seminars</i>	7
<i>Fall Semester Starts</i>	7
<i>IMS Short Course</i>	7
<i>Membership Fee Changes</i>	8
<i>IMS Talent Show</i>	8
<i>IMS Associates Program Members</i>	10
<i>Polymer Seminars</i>	11
<i>Associates Program Annual Meeting</i>	12
<i>Who's Who in America</i>	12
<i>Sample Preparation</i>	12

## Focus on Research

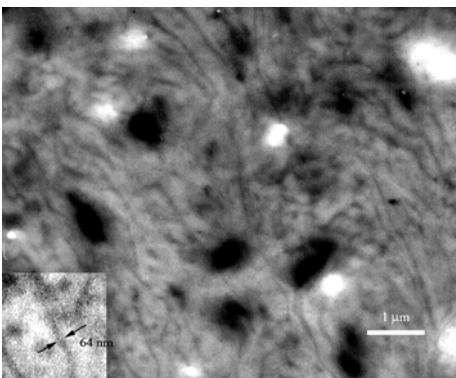
In each issue of this newsletter we profile one of the active research areas at IMS. In this issue we focus on the research being led by Richard S. Parnas, Associate Professor of Chemical Engineering.

After completing his BS in Chemical Engineering at MIT, Dr. Parnas moved west to the University of California (Los Angeles) where he obtained both his MS and PhD degrees in Chemical Engineering. On completing his PhD, Dr. Parnas again crossed the country and joined NIST (National Institute of Standards and Technology) as a chemical engineer and then Composites Group Leader in the Polymers Division. Dr. Parnas then spent a year on a Fulbright Scholarship as a Guest Professor at Katholieke Universiteit in Belgium before he joined the Polymer Program at the University of Connecticut in 2001. He has won numerous best paper awards including the International Conference of Automated Composites in 1999 and the SPE ANTEC (Annual Technology Conference) Meeting in 1995, 1998 and 2000; and a NIST Bronze medal. He is on the Editorial Review Board for Polymer Composites and Composites Part A.

At the Institute of Materials Science Parnas conducts research in the following areas:

### Wheat Protein Based Plastics for Sustainability:

New plastics are being developed from plant protein, a renewable and biodegradable resource, with sponsorship from NSF and USDA. Small quantities of reactive modifiers are added to the protein to improve the toughness by an order of magnitude and increase the stiffness. Current material has the stiffness and strength of epoxy with toughness intermediate between epoxy and polypropylene. The current challenge is stabilizing the properties of the protein based plastic to moisture. Atomic force and electron microscopy, and rheology are being used to discern the microphase separated morphologies of the protein/polymer blends.



TEM image at 6600x of a wheat protein – synthetic polymer blend, showing stringy polymer phase

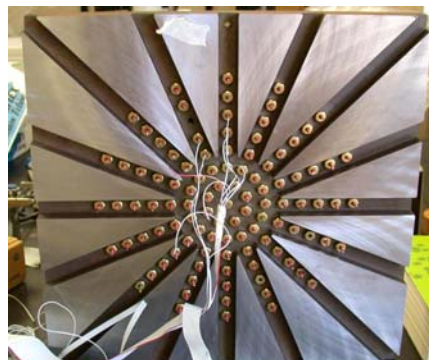
**Sensors for Fuel Cell Diagnostics:** A fluorescence sensor using a single optical fiber has been developed to measure moisture, temperature and other quantities in operating PEM (Proton Exchange Membrane) fuel cell assemblies,



Fiber optic sensors protruding from a fuel cell power assembly prior to testing for moisture content fluctuations during high power operation.

with sponsorship from the US Army and the Connecticut Global Fuel Cell Center. The small size of the optical fiber permits measurements at locations including the membrane, the gas diffusion layer, and fuel flow channels. An important result documents large fluctuations in membrane moisture content from point to point, as well as large fluctuations from moment to moment at a single point. These very dynamic operating conditions probably contribute to durability problems hindering large-scale use of fuel cells. The sensor system is portable and fast, and was recently tested in a commercial fuel cell power assembly to demonstrate its ability to gather valuable data without disrupting system operation.

**Composites for Civil Infrastructure:** The durability and processing of basalt fiber reinforced polymer composites are being investigated with sponsorship from the New England Transportation Consortium and DOE to determine their potential in transportation applications.



Back view of a high throughput permeability mold showing the 100 sensors used to visualize fluid flow through porous reinforcement material.

The basalt fabrics used for reinforcement appear to have the disordered and irreproducible 3D microstructures common in other reinforcements, which can lead to broad distributions in macroscopic properties, such as the

current material has the stiffness and strength of epoxy with toughness intermediate between epoxy and polypropylene. The current challenge is stabilizing the properties of the protein based plastic to moisture. Atomic force and electron microscopy, and rheology are being used to discern the microphase separated morphologies of the protein/polymer blends.

permeability. The permeability is a critical processing parameter in composite manufacturing operations such as liquid molding and pultrusion. High throughput experimental techniques were developed to permit the acquisition of sufficient data to reveal the stochastic nature of the permeability.

Some recent publications include:

1. D.L. Woerdeman, P.Ye, S.Shenoy, R.S. Parnas, G.E. Wnek and O.Trofimova, Use of Electrospinning to Probe Molecular-Scale Interactions in Native and Denatured Wheat Protein, *Biomacromolecules*, 2005, **6**, 707-712.

2. Y.P. Patil, T.A.P. Seery, M.T. Shaw and R.S. Parnas, In-situ water measurement in Nafion® membrane by Fluorescence spectroscopy, *Ind. Eng. Chem. Res.* **2005**, **44**, 6141-6147.

3. Q. Liu, M.T. Shaw, R.S. Parnas, A. McDonnell, Preliminary Investigation of Basalt Fiber Composite Properties for Applications in Transportation, Proc. Transportation Research Board Annual Meeting, January, 2005, Washington, DC, paper 05-1117, session 487.

More information regarding Dr. Parnas' research interests can be found at <http://www.ims.uconn.edu/poly/content/view/37/99/> or by contacting Professor Parnas directly ([rparnas@ims.uconn.edu](mailto:rparnas@ims.uconn.edu)).

## Governor Rell Signs Nanotechnology Legislation

On July 20, 2005 Governor M. Jodi Rell signed Special Act 05 – 13 to help create higher education degree programs in nanotechnology. The new law requires the Commissioner of Higher Education, in consultation with the Office of Workforce Competitiveness, to review the inclusion of nanotechnology, molecular manufacturing and advanced and developing technologies at

institutions of higher education. A report on their findings must be sent to the legislature by January 1, 2006. For more details see <http://www.caprep.com/0705041.htm>.

IMS will continue to be actively involved in this effort as it moves forward.

## Seery New Director of Polymer Program

Bob Weiss, Board of Trustees Distinguished Professor, Chemical Engineering, has stepped down as Director of the Polymer Graduate Program. Provost Nicholls has approved the appointment of Tom Seery, Associate Professor, Chemistry, to replace him, effective July 2005.

We thank Bob for his leadership as Director and his tireless efforts supporting the Polymer Graduate Program and IMS. We owe him our gratitude for keeping the Program moving forward.

We look forward to working with Tom in our efforts to raise the Polymer Graduate Program to the next level.

## Golf Balls

Both Bob Weiss, Board of Trustees Distinguished Professor, Chemical Engineering, and Tom Kennedy, Vice President of Research and Development for Top-Flite Golf (IMS Associates Program Member Company) were quoted in a

recent article in Chemical and Engineering News, regarding the influence of polymer chemistry on the evolution of the golf ball. See <http://pubs.acs.org/isubscribe/journals/cen/83/i29/html/8329golfballs.html> for details.

## Lei Zhu Awarded DuPont Young Professors Grant

Assistant professor of Chemical Engineering and the Polymer Program, Lei Zhu has been awarded one of just eight 2005 DuPont Young Professor Grants presented to North American researchers. Dr. Zhu's research investigates the synthesis and self-assembly of carbon nanotube-based liquid crystalline materials, and characterization and design of useful nanotechnology devices for the development of novel photovoltaics and nanotransistors. Dr. Zhu will re-

ceive \$25,000 yearly for three years.

Dr. Zhu joined the Chemical Engineering Department in fall 2002 with a specialty in polymer science. He earned his Ph.D. in polymer science from the University of Akron.

For more information see [http://www.engr.uconn.edu/SoE/pdf/Frontiers\\_Summer\\_05.pdf](http://www.engr.uconn.edu/SoE/pdf/Frontiers_Summer_05.pdf).

## New Instrumental Capability – SPEX Fluorolog 3

Molecules can absorb photons of light and at a later time emit photons. Typically the ejected light is of longer wavelengths than that absorbed. Depending on the time it takes to emit the photons, this process is known as either fluorescence or phosphorescence. IMS has recently purchased and installed a SPEX Fluorolog 3 for detailed investigation of this type of phenomena. The Fluorolog-3 spectrofluorometer is designed to perform analyses over the ultraviolet and visible regions of the spectrum as well as far into the IR. A xenon light source is coupled with a monochromator as an excitation source. Emitted radiation is also detected through a monochromating system.

For further instrumentation details see <http://www.jobinyvon.com/usadivisions/Fluorescence/product/flogcat.pdf>.

Applications of fluorescence spectroscopy are numerous and include applications in nanotechnology including fluorescence spectra from carbon nanotubes and photoluminescence spectroscopy of nanoparticles; and biotechnology including immunoassay of theophylline by fluorescence polarization, kinetic determination of vitamin B1, and fluorescent pigments in living coral. For additional information see <http://www.jobinyvon.com/usadivisions/applications.htm>.

## Recent Graduates of the Materials Science and Engineering Department

Student	Advisor	Year	Deg	Thesis Title
Christopher Gatto	Prof. Mark Aindow	May'04	BS	Effect of heat treatment on gamma-prime distributions in IN100
Jared Strand	Prof. Harold Brody/ Prof. M. Blackburn	May'04	BS	Improved processing of stainless sheet
Zachary Stone	Prof. Harold Brody/ Prof. Theo Kattamis	Dec'04	BS	Effects of HIP process on recycled aluminum
Andrew Ruminski	Prof. Pamir Alpay	Aug'04	BS	The pyroelectric response of BST 70/30 thin films on LAO, STO, MgO and Si substrates
Chang Lin	Prof. Harold Brody	Aug'04	MS	Sequence of phase appearance and microstructure development during the solidification of Al-Si-Cu-Mg-Fe alloys
Min Qian	Prof. Harold Brody	Aug'04	MS	Computer simulation of solidification and solution treatment of multi-component hypo-eutectic alloys
Douglas Logan	Prof. Theo Kattamis	May'04	MS	Master's degree - Plan B
Edgardo Mune	Prof. Mark Aindow	May'04	MS	Master's degree - Plan B
Anuj Sharma	Prof. Pamir Alpay	May'04	MS	Stress on pyroelectric response of ferroelectric thin films
Zhigang Ban	Prof. Pamir Alpay	Aug'04	PhD	Thermodynamic modeling of ferroelectric epitaxial films and polarization graded ferroelectrics
Liangde Xie	Prof. Eric H. Jordan	Aug'04	PhD	Development and implementation of a viscoplastic model for air plasma sprayed thermal barrier coatings
Erik Geiss	Prof. Harris Marcus	May'04	PhD	Fabrication and defect design in two-dimensional colloidal photonic crystals
Bin Li	Prof. Harold Brody	May'04	PhD	Real Time micro-radiography of dendrite growth and coarsening in Sn-13% Bi alloy
James Ruppen (Posthumous)	Prof. Arthur J. McEvily	May'04	PhD	On the fatigue of titanium alloys
Yunquan Sun	Prof. Kazem Kazerounian	May'04	PhD	Development of a unified flexible grinding process
Jie Wu	Prof. Nitin Padture	May'04	PhD	Novel low-thermal-conductivity ceramics for thermal barrier coating applications

## News from the Department of Materials Science & Engineering\*

Professor Leon Shaw, Interim Department Head, has been elected Fellow of the ASM International. Shaw was awarded a U.S. patent (along with R.M. Ren and Z.G. Yang) titled "Nanostructured Carbide Cermet Powders by High Energy Ball Milling," patent #6,793,875. Shaw was also awarded best poster for the 14<sup>th</sup> Annual Solid Freeform Fabrication Meeting.

Professor Pamir Alpay was the recipient of the University of Connecticut School of Engineering Outstanding Junior Faculty Award for 2004.

Professor Mark Aindow was the recipient of the 2004 Outstanding Department Member Award for his exceptional contributions in teaching, research and service to the department. He was also named editor of the Journal of Materials Science.

The Graduate Committee of the School of Engineering selected Dr. Zhigang Ban (advisor: Alpay) as

the recipient of the Outstanding PhD Thesis Award for his work in "Thermodynamic Modeling of Ferroelectric Epitaxial Films and Polarization Graded Ferroelectrics."

Kun Dai was named the Department of Materials Science and Engineering Outstanding Graduate Student for 2004. This award is conferred annually to a student who has demonstrated excellence in academic standing, research and service.

Mei Wen (advisor: Gell and Jordan) won First Prize in the Student Poster competition at the Annual Meeting of the American Ceramic Society in 2004. Her poster was entitled "Life Prediction of EB-PVD Thermal Barrier Coatings Based on the Measurement of Three Parameters." There were over 40 entries submitted from all over the world.

\*formerly Metallurgy and Materials Engineering

## Selected Recent Theses from the Polymer Program

### 2005

*Nano-Particle Formation in Zinc Sulfonated Polystyrene Ionomer/Thermotropic Liquid Crystalline Polymer Blend by Melt-Mixing*, Hyuk-soo Lee, Ph.D., Advisor: R. A. Weiss.

### 2004

*Degradation and morphological disorder in organic light-emitting diodes*, Mathew Mathai, Ph.D., Advisor: F. Papadimitrakopoulos.

*Enhanced Processability of Conductive Polymers via Solid-state Oxidative Cross-linking*, Sung-Yeon Jang, Ph.D., Advisor: G.A. Sotzing.

*Ordering Kinetics and Dynamics of Diblock Copolymer Solutions*, Zhizhong Liu, Ph.D., Advisor: M.T. Shaw.

*Studies of Layer-by-Layer Polyelectrolyte Adsorption*, Chris-

tophe LeFaux, Ph.D., Advisor: P.T. Mather.

*Preparation and Investigation of Tailored Shape Memory Polymers*, Changdeng Liu, Ph.D., Advisor: P.T. Mather.

*Development of Soft Polymeric Networks Showing Actuation Behavior: from Hydrogels to Liquid Crystalline Elastomers*, Ingrid Rousseau, Ph.D., Advisor: P.T. Mather.

*Microstructure of Hydrophobically Modified Alkyl Acrylamides*, Jun Tian, Ph.D., Advisor: R.A. Weiss.

*Fracture Toughening of Polypropylene with Liquid Crystalline Polymer*, Qi Wu, Ph.D., Advisor: R.A. Weiss.

*High Performance Thermosets: Liquid Crystalline Networks and Reactive Hyperbranched Additives*, Haihu Qin, Ph.D., Advisor: P. T. Mather.

## Suib Joins Elite Group of Chemical Pioneers

One of the top national awards in chemistry has gone to the head of the chemistry department, Steven Suib. Suib, a Board of Trustees Distinguished Professor and the Yuji Hayashi Distinguished Chair in Plasma Chemistry, was one of three recipients of the annual Chemical Pioneer award of the American Institute of Chemists. He received the award in Philadelphia on June 10.

Previous Chemical Pioneers include several Nobel Prize winners, including Linus C. Pauling. The award recognizes those who have made outstanding contribu-

tions with a major impact on advances in chemical science and industry.

Suib is an inorganic chemist and an international leader in the field of zeolite synthesis. Zeolites are microporous crystalline solids sometimes referred to as "molecular sieves." Work with zeolites leads to the development of new materials that are more environmentally friendly in, for example, the automotive industry.

For more information see <http://www.advance.uconn.edu/2005/050614/05061409.htm>.

## Incubator Helps Turn Scholarly Research Into Viable Business Ventures

The University of Connecticut Technology Incubation Program (TIP) aims to accelerate the successful establishment and development of entrepreneurial companies by providing laboratory/office space and an array of support resources and services which are available through the various departments and functions at the University.

Current TIP tenants include:

- ◆ MAK Scientific, investigating medications based on cannabinoid technology developed by Alexandros Makriyannis, a former UConn professor;
- ◆ Inframat, a nanotechnology company developing biosensors;
- ◆ Evergen Biotechnology, founded by Professor Xiangzhong "Jerry" Yang to improve dairy productivity and commercialize transgenic technology;
- ◆ I'mPACT Word, a Japanese spin-off working with Professor Steven Suib to develop plasma-assisted

catalytic technology;

- ◆ Sensor Research, developing biological agent and pathogen detection systems;
- ◆ Hepaticus, developing a patented technology for diagnosing and treating liver disease

TIP, together with the Center for Science and Technology Commercialization and the UConn R&D Corporation, is part of the University of Connecticut Office of Technology Commercialization (OTC). The three OTC programs provide a variety of resources to support entrepreneurs as they begin patenting and licensing and move to funding and commercialization. For more information see <http://www.advance.uconn.edu/2005/050222/05022208.htm> or contact Ian Hart, Ph.D., Director, Industrial Initiatives (IAN.HART@uconn.edu, 860 486-8344) or Rita Zangari, Executive Program Director, Technology Incubation Program (rita.zangari@uconn.edu, 860 486-3010).

## GE Advanced Materials Establishes \$500,000 Scholarship for African American Engineering Students

In early April, the School of Engineering received a cash endowment of \$500,000 for establishment of the GE Advanced Materials Endowed Scholar Program Fund, focusing on African American students. GE Advanced Materials, based in Pittsfield, MA, is a world leader in providing material solutions through engi-

neering thermoplastics, silicon products and technology platforms, and fused quartz and ceramics.

This permanent endowment will support undergraduate scholarships in the departments of Mechanical Engineering, Chemical Engineering and Materials Sci-

ence & Engineering. The fund will award \$4,000 - \$5,000 in scholarship monies to two entering freshmen yearly and will continue to support the recipients throughout their four years of study in the School of Engineering, provided academic performance requirements are met.

For more information see [http://www.engr.uconn.edu/SoE/pdf/Frontiers\\_Summer\\_05.pdf](http://www.engr.uconn.edu/SoE/pdf/Frontiers_Summer_05.pdf).

## Department Seminars

All fall seminar schedules have not been finalized at this time. We will send the Materials Science & Engineering Department schedule to our members when finalized. The Fall Semester Polymer Program Seminar Schedule is on page 11. This information, and the seminar schedules for most departments, will also be available on the Web. Abstracts of seminars are usually

available about a week in advance. We can also put you in touch with the faculty member sponsoring the seminar to learn more about the specific seminar of interest. We suggest you call before attending to be sure the seminar has not been canceled due to illness or weather.

## Fall Semester Starts

Spring semester classes start Monday August 29, 2005. Some courses that may be of interest include the following.

CHEM-380	Polymer Synthesis	Sotzing
CHEM-381	Polymer Physical Chemistry	Dobrynin
CHEM-382	Polymer Characterization	Sung and Seery
CHEG-351	Polymer Physics	Utz
CHEG-355	Morphology	Zhu
CHEG-368	Rheology and Processing	Shaw
BME-272	Biomaterials	Wei
MMAT-320	Materials Characterization	Huey
MMAT-320A	Metallurgy of Welding	Kattamis
MMAT-301	Thermodynamics of Materials	Brody
MMAT-345	Theory of Electrochemical Processes	Smirnova
MMAT-317	Electronic Materials	Alpay

## IMS Short Course

Plans are in development for next summer's short course. We welcome your suggestions for future short courses. You will receive detailed information in

the spring. All Associates Program member companies will receive one reduced price registration.

## Membership Fee Changes

Some time ago a careful and detailed review of all of the finances associated with the IMS Associates Program revealed that the Program was not adequately recovering its true expenditures. After much thought, review, input from members, and discussion with the IMS external advisory board (many of whom are representatives of Associates Program members) the following changes in fee structure are being implemented.

Beginning January 1, 2004 all new Connecticut companies with more than 250 employees joining the Program are charged an annual fee of \$25,000. Starting July 2004 all existing in-state members were offered continuing membership for one year at \$20,000 if they pay in full within 30 days of their renewal date.

All existing out-of-state members were handled exactly the same, i.e., given an option of staying at \$20,000 per year, for one year, if they pay in full within 30 days of their renewal date. In July of 2005 the an-

nual membership fee for out-of-state companies increased to \$30,000 per year. Again, for the year starting July 2005, all existing out-of-state member companies will be able to delay this increase by paying \$25,000 within 30 days of their renewal date.

Starting January 2004 new out-of-state members are charged an annual rate of \$30,000 per year.

Finally, for existing small (less than 250 employees) in-state members, the annual fee will be increased in a fashion similar to that of the large in-state members but details will vary depending on the size of the company. As with large companies, new in-state small company members have been charged the new rates since January 2004.

We hope you understand the necessity of these changes and look forward to continuing to serve our members in the future.

## IMS Talent Show

Thanks primarily to the efforts of Kim Post, June 29th saw the fourth IMS talent show/picnic held on the plaza outside IMS. Spirits were high and a good time was had by all. We close this issue of the newsletter with a few images from the event. Thanks to Jack Gromek and Gerald Ling for the photographs.

Venkataraman Seshadri played some Indian melodies on a flute.



## IMS Talent Show



Tom Seery did a repeat performance as Master of Ceremonies, keeping us entertained between acts.



Staff members Alicia Ross, Michelle Ross and Cathy McCrackan got the crowd involved playing “Name that Tune” to kazoo music.



Jonathan Doll and friends played classic rock.

## IMS Associates Program Members

**Aearo Company**

Southbridge, MA  
Safety Products

**Ahlstrom Fiber Composites**

Windsor Locks, CT  
Nonwoven Fabrics, Adhesives, Composites

**Arch Chemicals, Inc.**

Cheshire, CT  
Biocides, Microelectronic Materials

**Chemtura Corporation**

Middlebury, CT  
Polymers and Polymer Additives

**Dymax Corporation**

Torrington, CT  
Radiation-cured Coatings and Adhesives

**Enthone, Inc.**

West Haven, CT  
Chemicals for Electronics

**Foster Corporation**

Putnam, CT  
Plastics Compounding

**General Cable**

Willimantic, CT  
Electrical Cables

**Gentex Optics, Inc.**

Dudley, MA  
Prescription Plastic Eyeglass Lenses

**Gerber Scientific**

South Windsor, CT  
Optical and Printer Systems

**Heat Transfer Labels Solutions**

Southport, CT  
Heat Transfer Labels

**Johnson & Johnson Vision Care**

Roanoke, VA  
Prescription Eyeglass Lenses

**Laticrete International, Inc.**

Bethany, CT  
Ceramic Tile Adhesives

**Loctite Corporation**

Rocky Hill, CT  
Adhesives

**Medex, Inc.**

Southington, CT  
Hospital Products

**Norton Company/Saint-Gobain**

Northboro, MA  
Abrasive Products

**Okonite Company**

Paterson, NJ  
Electrical Cables

**Olin Corporation**

Waterbury, CT  
Metals for Electronics and Other Applications

**Pentron Clinical Technologies**

Wallingford, CT  
Dental Products

**Pfizer, Inc.**

Groton, CT  
Pharmaceuticals

**Phonon Corporation**

Simsbury, CT  
Acoustic Surface Wave Devices

**Radio Frequency Systems**

Meriden, CT  
Products for Wireless Communications

**Rogers Corporation**

Rogers, CT  
Polymer Products for Computers & Other Applications

**Spellman High Voltage Electronics Corporation**

Hauppauge, NY  
X-ray Equipment Power Supplies

**Techni-Met, Inc.**

Windsor, CT  
Advanced Depositions and Coatings

**Teleflex Medical**

Coventry, CT  
Hospital Products

**Top-Flite Golf Company**

Chicopee, MA  
Golf Balls and Clubs

**Tyco Telecom Laboratories**

Eatontown, NJ  
Undersea Intercontinental Telecommunication Systems

**Underground Systems, Inc.**

Milford, CT  
Underground Transmission Cable Technology

**United States Surgical**

North Haven, CT  
Surgical Products and Devices

## **POLYMER SEMINARS**

### **Fall Semester 2005**

- September 9            “Bionanotechnology Approach in Material Synthesis and Device Fabrication by Applying Peptide/Protein Assemblies”  
Prof. Hiroshi Matsui, City University of New York
- September 16           “New Catalysts for Constructing Polymers of Defined Architecture”  
Prof. Geoffrey W. Coates, Cornell University
- September 30           “Chemically Rich Macromolecules: Biomimetic Antimicrobials and Metal Containing Polymers”  
Prof. Gregory N. Tew, University of Massachusetts, Amherst
- October 14             “Pathways for Transition Metal Controlled Radical Polymerization”  
Prof. Bradford B. Wayland, University of Pennsylvania
- October 21             “Rational Design of Polyelectrolytes: Rigid Rod Polyphenylene Sulfonic Acid Polymers and Copolymers”  
Prof. Morton H. Litt, Case Western Reserve University
- November 11           “Design and Characterization of Multicompartment Micelles By Self-Assembly of ABC Terpolymers”  
Prof. Timothy P. Lodge, University of Minnesota
- November 18           “Nano-patterning in Polymeric and Biological Materials Based on Atomic Force Microscopy Electrostatic Nanolithography”  
Prof. Sergei F. Lyuksyutov, University of Akron
- December 16           “Nanofiber Technology: Challenges and Opportunities”  
Prof. Benjamin S. Hsiao, SUNY Stony Brook

All seminars are held on Fridays at 11:00 AM in IMS Room 20.

Coffee will be served at 10:45 AM outside the seminar room.

For more information, please contact YH Chudy at [yhchudy@ims.uconn.edu](mailto:yhchudy@ims.uconn.edu), (860) 486-3582 or visit [www.ims.uconn.edu](http://www.ims.uconn.edu).

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## **Associates Program Annual Meeting**

The Associates Program annual meeting was held on Wednesday May 18. Forty representatives from member companies joined IMS faculty, staff and students for the day's events. Titles and authors of presentations at the event follow.

### **“Failures in Inspection Procedures: Case Studies”**

Art McEvily, Professor Emeritus, Materials Science and Engineering

### **“Materials Computation at the Interface between Mesoscale and Nanoscale”**

Ramamurthy Ramprasad, Assistant Professor, Materials Science and Engineering

### **“Atomic Force Microscopy—Surfaces at the Nanoscale”**

Bryan Huey, Assistant Professor, Materials Science and Engineering

### **“Novel Drug Targeting and Vaccination Strategies with Peptide Nanoparticles”**

Peter Burkhard, Associate Professor, Molecular and Cell Biology

### **“Status of the IMS Associates Program”**

Myer Ezrin, Director of the IMS Associates Program

### **“IMS and the Future of Materials Research”**

Harris Marcus, Professor and Director of the Institute of Materials Science

## **Who's Who in America 2006**

Dr. Myer Ezrin, Director of the IMS Associates Program, will be listed in the 2006 edition of *Who's Who in America*.

## **Sample Preparation**

In many projects that the Associates Program deals with, such as adhesion and coatings, surface analysis techniques are extremely important. The techniques used for such analysis, particularly GC/MS, Auger electron spectroscopy (AES) and x-ray photoelectron spectroscopy (XPS) are extremely sensitive to small amounts of material on the surface. It is important to make efforts not to contaminate these surfaces during sample preparation, collection and shipment. **Shipment in common plastic bags should be avoided!** Common plastic bags typically contain significant amounts of additives used to prevent the plastics from adhering to themselves and other materials. These additives will migrate to the sample during shipment and at best make interpretation

difficult and sometimes impossible. It is much better to ship such samples in common kitchen aluminum foil (not industrial aluminum foil which is often coated with an oil or other release agent). Samples can also be shipped in glass containers with aluminum foil over the opening under the cap.

Alternatively special polyester bags that do not contain such additives can be purchased. One source of such bags is the Kapak Corporation, 5305 Parkdale Drive, Minneapolis, MN 55416, 612/541-0730. Typical price is about \$200 per thousand depending on the exact size. Be sure to specify non-contaminating/non-plasticized material.