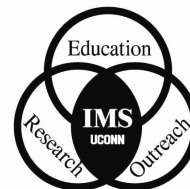




# University of Connecticut Institute of Materials Science



## IMS Associates Program Newsletter

Vol. 4, No. 2

August 21, 2000

### Metallurgy and Materials Engineering Undergraduate Program Begins

This fall marks a significant transition for the Department of Metallurgy and Materials Engineering. After much planning and preparation, the first freshman class will enter their new undergraduate program. The first class will graduate in the spring 2005. Students will be available for Co-op and summer intern positions in the very near future.

The Metallurgy and Materials Engineering BSE curriculum provides a balance of courses in humanities, social sciences, basic and engineering science, mathematics, and engineering design. Hands-on laboratories and workshops acquaint students with the techniques and challenges

of materials characterization and materials processing. Open-ended design projects are dispersed throughout the curriculum and culminate in a two-semester senior design project in which students work in teams with both faculty and industry mentors.

This is the only undergraduate Materials Engineering program at a state university in New England. Out-of-state students can attend the program at a tuition rate that is about half of the normal out-of-state rate. For further information visit [www.ims.uconn.edu/metal/](http://www.ims.uconn.edu/metal/) or contact the department at [metdept@mail.ims.uconn.edu](mailto:metdept@mail.ims.uconn.edu) or tel: 860-486-4620.

### Special Seminar on Antioxidants for Polymers

Wednesday, October 11, 11am, IMS Research Professor Peter Klemchuk will present a seminar on antioxidants for stabilization of polymers. This seminar was first presented at Uniroyal Chemical Company of Crompton Corporation as a Sigma Xi lecture. Dr. Klemchuk is a world renowned authority on polymer degradation and stabilization.

The seminar will be in room 20 of IMS and will be followed by a buffet lunch for members of the Associates Program. There will be plenty of time for members to discuss their interests and particular needs with Dr. Klemchuk. An announcement will follow with an abstract. In the meantime, mark October 11 on your calendars and plan to be here.

### New Members

Since our last newsletter two companies have joined the Associates Program.

- Crompton Corporation, Middlebury, CT, parent company of Uniroyal Chemical Co.

- SG Alternatives, East Hartford, CT

We welcome our new members and look forward to working with them. There are presently 33 members of the Program.

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## Short Course on Plastics Testing

As part of the Society of Manufacturing Engineers short course on plastics testing, Dr. Myer Ezrin will be lecturing on *Plastics Failure: Cause and Prevention*. The course will be held in Pittsfield, Massachusetts on Wednesday and

Thursday, October 11-12, 2000. For further information please contact Dr. Ezrin at 860-486-4628 (voice); 860-486-4745 (fax); or at ezrin@mail.ims.uconn.edu.

## Department Seminars

The Polymer Program seminar schedule is on page 8. The other seminar schedules have not been finalized at this time. This information will be available on the World Wide Web at [www.ims.uconn.edu/](http://www.ims.uconn.edu/). 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 also suggest you call before attending to be sure the seminar has not been canceled due to illness or weather.

## New Equipment

Pratt and Whitney recently donated to IMS a multi-technique Physical Electronics System 595 for surface analysis. This system has the capability of performing scanning Auger electron spectroscopy (AES), static AES, secondary ion mass spectrometry (SIMS) and x-ray photoelectron spectroscopy (XPS). These are surface analytical techniques capable of analyzing the top few atomic layers of a material. Ion milling for removal of adventitious contaminants and depth profiling can be combined with all three techniques. The system was received during the last semester and is up and working. Please feel free to contact Ed Kurz to discuss capabilities and sample requirements.

detector makes it possible to obtain absolute values of molecular weight by GPC. Molecular weights determined with other detectors are based on calibration with standards of known molecular weight. Such values may differ from the actual molecular weights. As a research laboratory working with new polymers, the new system is an important addition to our polymer characterization capability.

The gel permeation chromatography (GPC) lab has acquired a Wyatt multi-angle light scattering detector. This

The GPC lab has also obtained an evaporative light scattering detector made by Polymer Labs. This is for general GPC analysis for molecular weight distribution. Advantages over the commonly used refractive index detector are more stable baseline and better sensitivity.

## Symposium on Biorelated Materials

Samuel Huang, Professor of Chemistry at the University of Connecticut, and Emo Chiellini of the University of Pisa are co-chairs of a Symposium on Biorelated Materials as part of Poly Millennial 2000 to be held in Hawaii, December 9-13, 2000. An announcement is on page 9. The

conference will be held one week prior to Pacifichem 2000 in order to allow polymer scientists to participate in two international meetings upon making the trip to Hawaii.

## Acquisition of an Automated Digital Transmission Electron Microscope

An interdisciplinary IMS team, led by Dr. Mark Aindow (Associate Professor, Metallurgy and Materials Engineering), has been successful in obtaining funding from the National Science Foundation for the purchase of a new state-of-the-art automated digital transmission electron

microscope. The NSF will contribute approximately \$620,000 towards the new system. In addition, approximately \$420,000 of matching state funds have been committed by the University for the instrument and its operation.

The acquisition of the proposed instrument will have a dramatic impact upon the research programs of many science and engineering faculty at UConn. Five key programs have been identified which will make most use of the instrument in the first instance. The research areas are interfacial structure and defect-mediated interfacial processes in engineering alloys (Aindow, Metallurgy), kinetic studies of mineral reactions and textural evolution in silicate rocks (Joesten, Geology), microstructural evolution in tough ceramics (Padture, Metallurgy), EELS/ESI as a probe of magnetic structure in metals and alloys (Pease, Physics) and synthesis and characterization of inorganic helices (Suib, Chemistry). All of these programs depend critically on the high-resolution lattice imaging, ESI and/or PEELS capabilities of the new instrument. Other programs which will make use of the instrument include studies of interdiffusion microstructures, mechanically synthesized nanostructured materials, nanocrystalline thermal barrier coatings, pseudomorphically cladded nanocrystalline phosphors, solid freeform fabrication and spin-polarized electron filters.

The instrument will be operated as a central user facility, housed at IMS, for faculty, staff and students and will offer greatly enhanced capabilities in terms of penetration, resolution and new operating modes, as compared with the existing 17 year-old 100kV TEM. These features include an ultra-high resolution objective lens ( $C_s < 0.6\text{mm}$ ) giving a point-to-point resolution of  $< 0.19\text{nm}$ ; an image filter allowing PEELS and electron spectroscopic imaging

(ESI); a multi-scan charge-coupled device camera enabling images to be acquired and stored digitally; and fully automated microprocessor control allowing remote operation.

The configuration of the new instrument has been selected to allow maximum integration of research and education. Thus, in addition to the benefit which will accrue to those graduate students who will use the new TEM in their research programs, there will be substantial benefit from use of the instrument as an instructional tool for graduate and undergraduate classes. Such use will expose the students to modern analytical instrumentation which is not presently available to them. In this context the ability to operate the instrument remotely over the campus network will revolutionize classroom teaching of TEM and related topics at UConn by allowing faculty to combine more conventional teaching materials with live output from the microscope. Moreover, the ability to operate the instrument remotely over the internet will provide a powerful visual aid for use in outreach programs. Its use in presentations to groups in local industry and minority institutions will be extremely useful in attracting graduate students and in promoting diversity.

The details of the new TEM instrument and facility will be defined over the next few months. The instrument will then be specified, purchased and installed. Present plans call for the instrument to be operational in the summer of 2001.

## IMS Expansion - Construction Begins!

Construction has begun on the project that includes an expansion to the IMS to be located on the plaza of the Gant complex. The present building for the IMS was completed in the early 1970s. Since that time our growth has led to building rooms in the halls, converting three of the four seminar/class rooms into offices or laboratories, and serious overcrowding in the laboratories. IMS is very pleased that support from UConn 2000 has been made available for construction of a 15,000 sq. ft. addition.

Funds are badly needed to equip this new space and to upgrade outdated laboratory equipment in our existing space. This is truly a "once in 30 years" opportunity. Approximately \$5M is needed. The new building and associated update of research equipment at IMS will be very important in projects that are of interest to IMS Associates Program member companies. Examples include small spot x-ray photoelectron spectroscopy and time of flight SIMS facilities. Each of these equipment groupings costs in

excess of \$500,000. Several items will be available only at UConn in this region. As with all IMS facilities, they will be available to all Associates Program member companies. We respectfully request that member companies and friends consider, as partners and close collaborators, a one-time gift for the re-equipping of the Institute. This new equipment will help IMS, which already has an excellent reputation, step forward as a national leader.

In our 30 year history IMS has not made such an appeal. This is truly a special time when we need to advance our mutual interests through this equipment and facilities.

For further information please contact:  
Harris L. Marcus  
Director, Institute of Materials Science  
Tel. 860-486-4623  
Fax 860-486-4745  
Email: hmarcus@mail.ims.uconn.edu

## Xie Wins N.I.H. First Award

Dr. Xiang-Qun (Sean) Xie has received a NIH First Award (\$460,846) from the National Institutes of Health (NIH) for his project "Integrated NMR and Computer Modeling for Structure-Based Design". This project

represents a comprehensively combined NMR and computer modeling approach to acquire detailed information on the 3-D pharmacophoric requirements of biologically active molecules.

## Rust Color Analysis Leads to Forensic Dating of Metal Exposure

Recently the Waterford, Connecticut Police Department recovered a rusted moneybox and wanted to know how long it had been in the water. They brought the box to Dr. Norbert Greene, Professor of Metallurgy and Materials Engineering at IMS for examination. This is the type of example that can set into motion the wheels of scientific investigation. Dr. Greene began to think about the problem and whether the nature and extent of corrosion damage could be related to the length of time a firearm or other evidence had spent in a body of water. Over

the next several months and after over 1000 experiments involving samples of confiscated firearms and their placement in water, fresh and salt, an analysis of color was performed. Analysis of the color transformation allows the determination of submersion time up to approximately five months. Beyond that little, if any, change is detectable. As of now, thanks to Dr. Greene's research the law enforcement agencies have another valuable investigative tool.

## Research Team Develops New Coating for Use on Navy Ships

Researchers at the University of Connecticut and Inframat Corporation have developed a revolutionary new coating for use by the Navy on ships and submarines. The new coating is much more durable than the coatings used today. The new nano-structured alumina-titania coating has structural features 100 to 1000 times smaller than those found in conventional coatings. These tiny features give nano-structured coatings extraordinary wear, impact,

toughness and adhesive properties. The research team consists of Maurice Gell, Leon Shaw and Nitin Padture of the University of Connecticut Metallurgy and Materials Engineering Department; Eric Jordan, Baki Cetegen and Ted Bergman from the University of Connecticut Department of Mechanical Engineering and Inframat, a small Connecticut company headquartered in New Haven.

## IMS Short Courses

This summer the IMS Associates Program offered two short courses: **Polymer Characterization** with Tom Seery (Assistant Professor of Chemistry, Polymer Program, University of Connecticut) and **Introduction to Design of Experiments** with Uwe Koehn (Emeritus Professor of Statistics, University of Connecticut). Both courses were well attended and received.

We will offer two courses next summer. We will choose from the three courses described below. Cost per registrant will probably be about \$500. Associates Program members will receive one free registration per course. I would appreciate your comments and suggestions regarding these or other possible courses.

**Response Surface Methodology** (continuation of Introduction to Design of Experiments)

After having found out which parameters or factors are important to a process, it is still necessary to determine their optimal settings. To attack this problem, we will begin with fractional factorial designs and then move to Rotatable designs. These designs give equal information in all directions on the surface. To minimize the number of experimental runs, blocking and sequential designs will be considered. Designs that answer questions such as: are more experiments necessary, in which direction is the optimum, are we near the optimum, and what does the response surface look like will be introduced. Questions of stability of response based on Taguchi philosophy are also studied. For processes already in use, we will look at the method of Evolutionary Operation which encourages continuous improvement. The instructor will be Uwe Koehn, Emeritus Professor of Statistics.

**Plastics Failure**

This course is designed to take some of the mystery out of why plastics fail by demonstrating the role of the major factors that determine if there will be failure or success: material, design, processing and the effect of service conditions. The course bridges the gap between theoretical and basic aspects of polymers and the failure of plastics formulations in commercial and industrial practice. Failure prevention is emphasized throughout the course. Case studies of wide-ranging types of failure of different materials and applications illustrate underlying principles. The instructor will be Dr. Myer Ezrin, author of the book "Plastics Failure Guide: Cause and Prevention", which will be used in the course.

**An Overview of Surface Analytical Techniques**

This course will review the fundamentals of the most common surface analytical techniques including SEM/EDX/WDX, AES, XPS, SIMS, AFM/SPM, RBS and TEM. The experienced professional will gain breadth of knowledge in techniques complementary to their core skills, while those new to surface analysis will obtain a good survey of the capabilities and application of these techniques. With the knowledge gained from this seminar, participants will be able to make informed decisions about which technique to use, thereby increasing the efficiency of and reducing the cost of analytical services. Case studies of wide-ranging applications will be presented. The instructor(s) are still to be determined.

**Short Course Registrations**

In the past a small number of people have registered for short courses through the Associates Program and not attended. The Associates Program must still pay full price in this situation. Please note that participant substitutions

can be made at any time and registration can usually be canceled at minimal cost until the day before the course. We understand that occasionally plans must change but request your assistance when such changes occur.

**School of Engineering Receives Record-Setting Endowment from UTC**

United Technologies has made a record-setting investment in the School of Engineering with its gift this spring of \$4 million to support new engineering education initiatives. It is the largest gift UTC has ever given to an educational institution. It is also the largest ever given to the UConn School of Engineering and the largest ever given to a public school of engineering in New England. The

gift will be matched with \$2 million in State funding. The combined \$6 million from UTC and the State will be used to endow three chaired faculty positions, sponsor four named junior faculty positions in the first three years of their careers, and establish a \$1 million endowment for undergraduate scholarships.

**Fall Semester Starts**

Fall semester 2000 classes start Wednesday, August 30, 2000. Some courses that may be of interest include the following.

CHEM-380	Polymer Synthesis	G. Sotzing
CHEM-381	Polymer Physical Chemistry	M. Utz
CHEM-381	Polymer Characterization I	C. Sung
CHEG-351	Polymer Physics	P. Mather
CHEG-368	Rheology and Processing Lab	M. Shaw
MMAT-301	Metallurgical Thermodynamics	L. Shaw

MMAT-311	Mechanical Properties of Materials	N. Padture
MMAT-320	Physical Ceramics	T. Kattamis
MMAT-322	Microscopic Investigation of Materials	M. Aindow
MMAT-343	Corrosion	N. Greene

Some courses require pre-approval of the instructor. For further information please call Ed Kurz.

## Research Experience for Undergraduates

This summer several undergraduates took part in a 10-week, NSF funded, research experience for undergraduates program in various university departments and in the Polymer Program. On August 4 the students presented a poster session detailing their experience. The students

names, summer advisor, home college/university and project title are listed on page 10. For further information on this program please contact Dr. Greg Sotzing (860-486-4619; g.sotzing@uconn.edu).

## Cluster Power

The Connecticut Department of Economic and Community Development (DECD) has opted to use an industry cluster system for aiding strategic and tactical planning of economic development in Connecticut. The cluster concept utilizes the notion that a group of companies in a given industry or complex have certain mutual problems which, if defined, can be addressed more broadly for the industry rather than deal less effectively with the individual companies.

Connecticut DECD in concert with several ad hoc industrial and commercial committees has identified six industry clusters - Tourism, Financial Services, Manufacturing, High Technology, Telecommunications and Healthcare Services - that are being given focused attention in the coming months and years to address their concerns. The modus operandi has been to identify a host for each cluster, and for DECD to help in the early stages of admini-

stration and planning.

There is an effort underway to explore the value of a materials subcluster under a manufacturing or advanced technology cluster. The time is right for getting attention drawn to materials problems, issues, etc., in Connecticut through the cluster concept if enough common avenues can be found to link people and companies to qualify as a cluster. The Connecticut DECD has championed the cluster concept for state economic development.

For additional information please contact Jack Crane, CONN/STEP, 203-786-5481, 203-786-5037 (fax), jcrane@connstep.org; Dr. Harris L. Marcus, IMS, UConn, 860-486-4623, 860-486-4745 (fax), hmarcus@mail.ims.uconn.edu; or Dr. Martin Blackburn, IMS, UConn, 860-486-6832, 860-486-4745 (fax), blackbur@mail.ims.uconn.edu.

## Associates Program Annual Meeting

The Associates Program Annual Meeting was held on Tuesday, June 6, 2000. In the morning we had four presentations from new faculty members (Mark Aindow, Patrick Mather, Greg Sotzing and Marcel Utz) followed in the afternoon by a panel discussion on "Trends in Materials Research and Industry-Academia Collaboration". Representatives of four of our member companies (Anthony DeMaria, Chairman and CEO, DeMaria ElectroOptics Systems; Bruce Kosa, Vice President of Technology,

Rogers Corporation; Alan Meierhoefer, Vice President and Research Fellow, Dexter Corporation; and Hank Temme, Manager, Materials Science and Testing, Loctite Corporation) served as panelists and Harris Marcus, Director, IMS, University of Connecticut was the moderator. Thanks again to our speakers and panelists. Tours were provided after the meeting adjourned for those new to IMS.

## Current Topics in Adhesion Science and Composites

On May 22, 2000 a symposium entitled "Current Topics in Adhesion Science and Composites" was held at the Institute of Materials Science in honor of Professor Jim Bell's (Professor of Chemical Engineering, University of Connecticut) 65th birthday.

Approximately 70 attendees heard presentations from internationally known scientists including: Moshe Narkis

(Technion, Israel), Guy Davis (DACCOSCI), Tony DiBenedetto (UConn), Ray Dickie (Ford), Larry Drzal (Michigan State Univ), Jim Wightman (Virginia Tech), Sam Huang (UConn), Jude Iroh (Univ. Cincinnati), Hee-Woo Rhee (SoGang Univ, Korea), Randy Schmidt (Dow Corning), Jeng-Li Liang (International Imaging Materials) and Rajat Agarwal (Henkel Surface Tech).

## Short Course at Loctite - Introduction to Polymer Science

In April 2000, Professor Pat Mather gave a four-lecture short course at Loctite Corporation, "Introduction to Polymer Science." He is the instructor for a chemical en-

gineering undergraduate course, CHEG 256, "Polymeric Materials."

## Polymer Program Advisory Board Meeting

The Polymer Program Advisory Board Meeting was held on May 23, 2000. As part of this meeting a poster session

was held at IMS. Titles and authors are listed on page 11.

## Associates Program Activity Makes Use of the Entire University

The following are examples of the utilization of areas other than IMS on requests of Associates Program members.

1. X-ray radiology at the UConn Health Center in Farmington for industrial (non-medical) applications and for medical materials applications.
2. Uses of MRI (magnetic resonance imaging) facilities at the Health Center for medical materials applications.
3. Water analysis at the Environmental Research Institute.
4. The Plant Science Department of the School of Agriculture to identify an unknown plant contaminant.

5. Physics Department for consultation and analysis of magnetic materials.
6. Microchemistry Laboratory of the School of Agriculture to identify organic compounds by liquid chromatography/mass spectrometry.
7. All engineering departments on various matters.
8. Statistics Department on experimental design.
9. Market Research by the School of Business Marketing Department.

Companies may be asked to share or pay in full for the cost of activity outside of IMS.

## Practical Process Control – Chemical Engineering Short Course

Professor Doug Cooper of the Chemical Engineering Department will be offering a two-day short course entitled "Practical Process Control" on September 12 & 13, 2000 and again on October 24 & 25, 2000. This course is a unique training experience that addresses the real needs of industry personnel working in a broad range of production and pilot-plant operations. The course teaches new skills and proven methods that will help you in your job, which in turn means helping the bottom line of your company. The course begins by laying a firm foundation in the important basics of PID control. We then move on to explore some of the newer control methods, tools and techniques popular in current industrial practice.

The course is designed for a mixed audience including those who have had some training in the past and seek a refresher course, and those who have not had much formal training but desire to learn more.

More information can be found at [www.engr.uconn.edu/control](http://www.engr.uconn.edu/control). Please note that the Associates Program only offers financial assistance with registration to short courses sponsored by the IMS and does not offer assistance to those offered by other departments.

**POLYMER SCIENCE SEMINARS  
Fall Semester 2000**

- September 19**  
(Tuesday)      **Complex Flows of Viscoelastic Liquids:  
Results and Insights from Two Model Problems**  
*Prof. Susan J. Muller, University of California at Berkeley*  
(A Joint Seminar with the Chemical Engineering Department)  
Seminar will be held at 11:00AM in UTEB, Rm. 150
- September 29**      **New Materials from High Temperature Polymers and Composites to  
Functionalized Elastomers**  
*Prof. Valerie V. Sheares, Iowa State University*
- October 13**      **Engineering Biomimetic Biomaterials at the  
Biological Scale**  
*Dr. Steven Goodman, University of Connecticut Health Center*
- October 20**      **Biomimetics within the Air Force Research Laboratory**  
*Dr. Morley Stone, Wright Patterson Air Force Research Lab*
- October 27**      **Implantable Glucose Sensor: Progress and Problems**  
*Dr. Francis Moussy, University of Connecticut Health Center*
- November 3**      **Materials Science through the Microscope**  
*Dr. Catheryn L. Jackson, National Institute of Science and Technology*
- November 17**      **Soft Matter Under Osmotic Stress**  
*Prof. Helmut H. Strey, University of Massachusetts at Amherst*
- December 1**      **Self-Healing Composites**  
*Prof. Scott White, University of Illinois at Urbana-Champaign*
- December 8**      **Mechanical Properties of Soft Biological Tissues and Engineered  
Biomaterials**  
*Prof. Lori Setton, Duke University*

All seminars are on Fridays at 11:00 AM in IMS Room 20 unless otherwise noted.  
Coffee will be served at 10:30 AM outside the seminar room.  
For more information, please contact Y.H. Chudy at (860) 486-3582; Fax (860) 486-4745;  
E-mail [yhchudy@ims.uconn.edu](mailto:yhchudy@ims.uconn.edu) or visit [www.ims.uconn.edu](http://www.ims.uconn.edu) on the Web.

*This seminar series is sponsored in part by the Wesley Jessen Corporation.*

**POLY MILLENNIAL 2000**  
An International Conference

Including Biennial Events Sponsored by  
The Division of Polymer Chemistry  
American Chemical Society

**Hilton Waikoloa Village**  
**Waikoloa, Hawaii**  
**December 9-13, 2000**

**Symposium on Biorelated Materials**

- Biocompatibility and biodegradation
- Polymers from renewable resources
- Biomedical & pharmaceutical applications
- Consumer and commodity applications
- Ecological aspects and waste management
  
- ◆ Oral and poster presentations

**Co-Chairs:** Samuel J. Huang and Emo Chiellini

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## Research Experience for Undergraduates

This summer several undergraduates took part in a 10-week, NSF funded, research experience for undergraduates program in the Polymer Program and Chemistry Department at the University of Connecticut. On August 4 the students presented a poster session detailing their experience. The students names, summer advisor, home college/university and project title are listed below. For further information on this program please contact Dr. Greg Sotzing (860) 486-4619; g.sotzing@uconn.edu)

<u>Student</u>	<u>Advisor (UConn)</u>	<u>Student's College/University</u>
Broadbent, Stacy <i>Microwave Spectrum and Conformation of Vinyl Chloroformate</i>	Bohn	Holy Cross College
Cheung, Jason <i>Synthesis of a Novel Polyimide Monomer, 3FDA-Br</i>	Scola	Tufts University
Daniell, Heather (SURF) <i>Synthesis of 2,3-vic-Dimethoxy-meso-tetraphenylchlorins</i>	Brucker	University of Connecticut
Dunn, Matt (SURF) <i>The Preparation of Eynols from 2,3-Dimethyleneoxetanes</i>		University of Connecticut
Emch, Joseph <i>Studies in Synthesis and Utility of Strained Oxygen Heterocycles</i>	Howell	Ohio State
Fleming, David <i>Surface Initiated Polymerization of Isocyanates</i>	Seery	Providence College
Goldblum, Amy <i>Cyclization of Olefinic Organolithiums</i>	Bailey	Fort Lewis College
Huisinga, Lisa <i>The Synthesis of Macromonomers Based On Poly(dodecamethylene tartrate)</i>	Huang	Truman State
Hurd, Lisa <i>Towards the Synthesis of a Hyperbranched Conductive Polymer</i>	Sotzing	Richard Stockton College
Jordan, Kevin <i>Developing a Protocol for Optimal Retinal Isomer Separation on a High Pressure Liquid Chromatography System</i>	Birge	Indiana University of Pennsylvania
LaChapelle, Erik <i>Regioselective Electrophilic Aromatic Substitution of Aniline Through a Tin Anilide</i>		University of Connecticut
Mabb, Angela <i>A Potential DNA Crosslink from Reduced Derivatives of 1,6- and 1,8 Dinitropyrene</i>	Basu	Clarkson University
Miller, Deborah <i>Linear Dichroism of the Light Harvesting Complex of Rhodobacter Acidophila</i>	Frank	Colgate University
Molyneux, Heather <i>Recommissioning of a Dye Laser with Use of a Different Pump Wavelength</i>	Michel	Wilson College
Nason, Dana (Pfizer) <i>Studies on the Synthesis of meso-Phenyl-dipyrro- and tetrapyrromethanes</i>	Brucker	University of Connecticut
Okeyo, Sherrad <i>Regiospecific Bromination of Indole</i>	Smith	Rutgers University
Rawlings, Ron <i>Nano-Scaffolding of Protein Building a Protective Solid Case Around Enzymes</i>	Kumar	University of Nebraska
Roy, Dave <i>Application of Compressed CO<sub>2</sub> in Ultrahigh Molecular Weight Polyethylene</i>	Shaw	Westfield State College
Roy, Marc <i>Detection of Chemically Induced DNA Damage by Square Wave Voltammetry</i>	Rusling	Assumption College
Safraz, Soha <i>Novel Designs for E-Beam Resists</i>	Gonsalves	Chestnut Hill College
Scruggs, Neal <i>A Chemiresistive Polyaniline Electronic Nose for the Detection and Discrimination of Volatile Organic Compounds</i>	Sotzing	University of Kentucky
Stermole, Ben <i>Polymer Growth on Silica Nanoparticles Growth and Coating of Base Particles</i>	Seery	SUNY, Buffalo
Struzynski, Charles (Pfizer) <i>Preparation of 2-Benzylideneazetidines via Benzylidenation with Dibenzyltitanocene</i>	Howell	University of Connecticut
Sun, Frank <i>Hydrogel Actuators and Electrochemical Responses</i>	Mather	Carnegie Melon
Whitney, Carolyn <i>Catalytic Oxidation of Alcohols</i>	Suib	Providence College
Williams, Suzanna <i>Oxidation of 2,3-vic-Dihydroxy-meso-tetraphenylchlorin</i>	Brucker	Providence College

Additional funding was also furnished by the Harold Schwenk Fund for Innovative Education in Science, Bristol-Myers Squibb, Pfizer and the University of Connecticut. SURF is the Summer Undergraduate Research Fellowship Program at the University of Connecticut. Several students also participated in this same program in the Physics Department

### Polymer Science Program - 2000 Poster Session - May 23, 2000

**Advisor: J.P. Bell**

Nicole Baker Molecular Complex Formation and its Effects on S-Poly  
 Chun-Yong Wu Treating S-Poly Coating at Lower Temperature  
 Haipeng Zheng Synthesis of Fluorinated Coatings on Aluminum by Spontaneous Polymerization

**Advisor: K.E. Gonsalves**

Yongqi Hu E-beam Nanolithography via Inorganic-Organic Nanocomposites  
 Hengpeng Wu Polymeric Photoacid Generators in E-beam and DUV Submicron Lithography  
 Wei He New Designs in Hydrogels and their Potential Patterning by MIB

**Advisor: S.J. Huang**

Monica Ramos Synthesis of New Monomers Derived from Pentaerythritol  
 Dawn A. Smith Surface Modification Using Multi-component Polymers (co-adv: Koberstein)

**Advisor: F. Papadimitrakopoulos**

Jeunghoon Lee CdSe Quantum Dot Based Electroluminescence  
 Debjit Chattopadhyay Carbon Nanotube/Nafion Composites for Actuators and Supercapacitors  
 Thomas Phely-Bobin Self-Assembly of Si/SiO<sub>x</sub> Nanoparticles on Polymeric Materials for Photonic Band  
 Gap Applications (co-adv: Huang)  
 Thomas Phely-Bobin Spontaneous Monolayer Adsorption of Colloidal Silicon Nanoparticles on Glass Substrates (co-adv:  
 Huang)  
 Changqing Chen Synthesis of Bisquinoline and its Applications in Self-Assembly  
 Jeremiah K. Mwaura Metal Chelation Assembly of a Segmented Polyurethane  
 Izabela Galeska Novel Humic Acid-Based Membranes for Implantable Glucose Sensor: Characterization and Biocom  
 patibility Studies  
 Izabela Galeska Semipermeable Thin Film Composites for Implantable Glucose Sensor  
 Eyoung Shin Characterization and Morphological Studies in Alq<sub>3</sub>/Almq<sub>3</sub> Blend  
 Mathew Mathai & Keith Higginson Change Transport in Alq<sub>3</sub> in the Presence of Deep Traps

**Advisor: D.A. Scola**

Christopher Simone Synthesis and Characterization of Low Viscosity Fluorinated Phenylethynyl End-Capped Polyimides

**Advisor: T.A.P. Seery**

Catherine Fu Polymerization Kinetics of Norbornene on Gold Nanoparticles  
 Richard Niro Solution Properties and Association of Poly(benzyl p-phenylones)  
 Mark Jordi Surface Initiated Polymerization of Chiral Isocyanates from Silica Beads  
 Fatma Vatansever Surface Initiated Polymerizations of ROMP Catalysts from Silica Surfaces

**Advisor: M.T. Shaw**

Edwin Cua Measuring the Low-Frequency Linear Viscoelastic Properties of Polyolefin Melts  
 Chris Kels Nano-filled Dielectrics  
 Tao Xu Shear Induced Phase Behavior of Polymer Blends (co-adv: Weiss)  
 Sunny Bhat Long-term Aging of Nuclear Plant Cables  
 Caroline Decker Conductive Elastomers used for Weighing Highway Vehicles in Motion

**Advisor: C.S.P. Sung**

Erik Maandi Cure characterization in anaerobic polymerization  
 Zhen-nian Huang Synthesis and Characterization of New LE Materials

**Advisor: R.A. Weiss**

Goknur Bayram Reactive Blending of Nylon and Ionomer  
 Liang Xu Crystallization of Polycarbonate in Polycarbonate/Ionomer Blend  
 Hyuk-soo Lee Miscible Blends of LCP/Ionomer Blends  
 Younggon Son Crystallization of LCP/PEKK Blends  
 Suresh Shenoy Synthesis of Conductive Foams Using Supercritical Carbon Dioxide

**Advisor: Patrick T. Mather**

Antonio Senador Electrospinning of Polymer Fibers for Nanocomposites (co-adv: Shaw)  
 Seung B. Chun Hydrogel Actuators: Electromechanical and Thermal Responses

**Advisor: S.L. Suib**

Kelly J. Jordan Determination of the Degradation Mechanism of PVC

**Advisor: J.T. Koberstein**

Dongman Cho Polydimethylsiloxane in Supercritical Carbon Dioxide  
 Ralf Mason Polymer-Polymer Adhesion Promotion by Block Co-polymer Addition  
 Derek Wong Surface Reorganization in Functional Polymers

**Marcel Utz**

Marcel Utz Solid State NMR Investigation of Local Order in Plastically Deformed Polycarbonate

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## 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 which 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.

## Julian F. Johnson

It is our sad responsibility to report the death of Julian F. Johnson at the age of 76 in Las Vegas, Nevada on June 24, 2000. Johnson was Professor Emeritus of Chemistry at the University of Connecticut. He received his B.S. from the College of Wooster (Ohio) in 1943 before entering the Navy, where he was engineering officer aboard several destroyers in both the Atlantic and Pacific campaigns of World War II. He then earned a Ph.D. in chemistry at Brown University and spent the next 18 years at the Chevron Research Company. Johnson joined the Chemistry Department and the Institute of Materials Science in 1968 and became Associate Director of IMS in 1971. He retired in 1989 as Professor of Chem-

istry, after having mentored 30 Doctoral students and a dozen Masters students, and produced over 300 publications. He lectured widely, was a visiting scientist at both IBM and Avery International and won many awards including the ACS National Award in Chromatography and Electrophoresis. He will best be remembered for his almost uncanny ability to lead young scientists into independent activity, many times of an extraordinary level of accomplishment, and for his acumen and energy in fostering the development of the Polymer Science Program and the Institute of Materials Science at the University of Connecticut.