

# PSE Alumni Magazine

Fall 2003

**Welcome to the first edition of the new PSE Alumni Magazine!** Over the past two years, a number of PSE faculty and staff considered methods through which we could keep in closer touch with our Alums. We ultimately concluded that we wanted to do more than simply keep in touch, and thus we have created the *PSE Alumni Club* and the *PSE Alumni Magazine*.

The PSE Department at UMASS Amherst has produced hundreds of Ph.D.'s that represent some of the most successful polymer scientists and engineers in academics and industry. The *Alumni Club* will establish an interactive network that can include professional recruiting, collaborative activities, social events at scientific meetings, or any variety of activities through which a professional network of your fellow PSE alums can be of benefit. The Alumni Club will be coordinated through the combined efforts of faculty, students, and the CUMIRP office, and is extraordinarily easy for you to join with a financial contribution to the Department. However, your *PSE Alumni Club* membership does not depend on the amount of your contribution. A gift of \$100, \$10,000, or anywhere in-between will establish your membership in the most talented network of polymer scientists in the world.

Your level of support *will* impact the educational programs in the PSE Department, particularly in the area of first-year graduate student stipends. As you remember, perhaps all-too-well, first-year students in PSE are consumed by courses and cumulative exams. They have very little time for research, and thus cannot easily be supported on faculty research grants. As support for first-year students through Department funds and other sources becomes increasingly difficult, it is imperative that we find ways to support the learning environment of these students, in order to continue to provide an education of the highest quality during their first year. We believe that Alumni support of first-year student stipends will be extremely helpful as we look to the future of the Department, and we believe further that support during the most fundamental period of the Ph.D. experience is an appropriate and meaningful area for Alumni to contribute.

Each Fall and Spring Semester, *The Alumni Magazine* will update the latest activities in PSE and of Alums. The content will vary with each issue, but the major themes will center on research in the Department, developments in the CUMIRP and MRSEC programs, outreach programs for the education of our local community, and the professional activities of Alumni. Comments, criticisms, and suggestions from our Alumni regarding the *Magazine* and *Club* are welcome, and in fact are absolutely essential for the success of these endeavors. We have high expectations, and hope that you will join us!

With best wishes and warmest regards,

Todd Emrick, Assistant Professor, Magazine Editor  
Jim Capistran, CUMIRP Director, PSE Entering Class 1981  
Tom McCarthy, Department Head PSE

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## Congratulations to the 2002-2003 PSE Graduates!

### Student/Advisor/Dissertation Title

- Garth Brown / Jim Watkins / *Preparation of Ordered Nanocomposites in Polymeric Templates Swollen by Supercritical Carbon Dioxide*  
Terrence Caskey / Tom McCarthy & Alan Lesser / *Development & Characterization of Ordered, Highly Oriented Composite Laminates Using Supercritical Carbon Dioxide*  
Kathleen Di Zio / Dave Tirrell / *Polymer Matrices Engineered for Control of Cells and Tissue Behavior*  
Ru Feng / Dick Farris / *Linear Thermo-Elastic Characterization and Processing: Structure-Property Relationship of Thin Polymeric Films and Coatings*  
Sheng Hong / Sam Gido & Bill MacKnight / *Nanostructures of Crystalline Block Copolymers*  
Xinquiao Jia / Tom McCarthy / *Chemical Modification of Solid Surfaces & Interfaces, and Template-Assisted Fabrication of Surface Nanostructures*  
Scott Kennedy / Tom Russell & Dave Tirrell / *Biological Activity and Dynamic Structures in Artificial Protein Hydrogels*  
Zhiqun Lin / Tom Russell / *Surface and Interfacial Structures Induced by Electrohydrodynamic Instabilities*  
Robin McKiernan / Jacques Penelle & Sam Gido / *Characterization and Crystallization of Model Semi-Crystalline Polymers: Influence of Hydrogen Bonding, Heteroatoms and Chemically-Engineered Lamellar Thickness*  
Jeremy Morin / Dick Farris / *Thermoset Recycling via High-Pressure High-Temperature Sintering: Revisiting the Effect of Interchange Chemistry*  
Daniel Mowery / Klaus Schmidt-Rohr / *Investigation of the Structure of Cold-Drawn High-Density Polyethylene Using Solid-State NMR*  
Brian Price / Dave Hoagland / *Chain Scission in Turbulent Flow of Dilute Polymer Solutions*  
Arun Raman / Dick Farris / *Theoretical and Experimental Issues in the Deformation of Elastomers and Environmental Stress Cracking*  
Cynthia Welch / Dave Hoagland / *Polyelectrolyte Electrophoresis: Effects of Molecular Weight and Macromolecular Architecture*  
Paul Welch / Muthukumar / *Modeling in Polymeric Systems*  
Kathryn Wright / Alan Lesser / *Investigation Into the Mechanical and Physical Behavior of Thermoplastic Elastomers*  
Adam Zerda / Alan Lesser / *Molecular and Nanoscale Reinforcement of Polymers*  
Lei Zheng / Dick Farris & Bryan Coughlin / *Polyolefin Cubic Silsesquioxane Nanocomposites.*

## Faculty profile

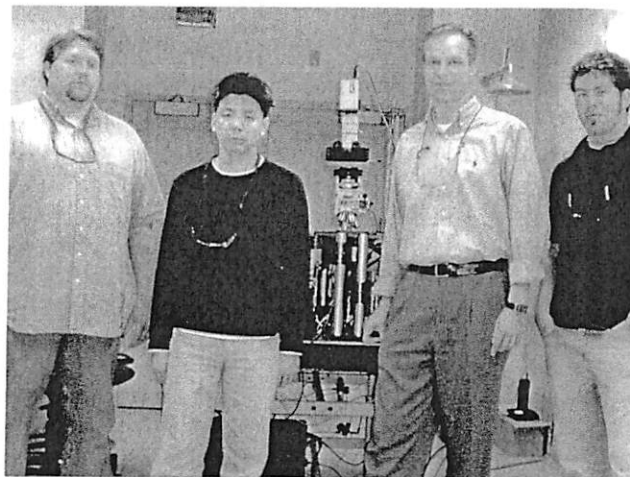
### Al Crosby, Assistant Professor

In September 2002 we welcomed our newest faculty member to PSE, Assistant Professor Al Crosby (Ph.D: Northwestern Materials Science; Postdoc: NIST, Washington D.C.). Al has spent his first year jump-starting his research group, which currently includes first-year PSE students Jong-Young Lee and Mark Hageman. Al, Mark, Jong-Young, and research fellow D.J. Singh have been working diligently to initiate their new research program. The underlying theme of Al's research is the influence of lateral heterogeneities on the mechanics of polymer interfaces.

The effect of lateral heterogeneities on polymer adhesion and friction is critical to technologies such as microelectronics packaging, coatings and adhesives, micro-electromechanical systems (MEMS), and tissue engineering. In each of these areas, interactions between surface and near-surface material properties play a critical role in determining function. It has long been known that lateral heterogeneities in the near-surface region of a material define the success or failure of interface-dependent applications. Crosby is particularly interested in issues associated with 1) understanding the length scale and magnitude of heterogeneities that affect adhesion and frictional properties, and 2) using heterogeneities to systematically design the adhesion and frictional properties of real surfaces. To answer these questions, they use controlled heterogeneities, or systematic patterns, to understand the complex coupling. This effort focuses on topographical patterning, surface chemistry, and near-surface composition to design and engineer novel surfaces that can predictably tune their adhesion and frictional properties. The ability to tune heterogeneities will present opportunities to design smart and responsive interfaces. Mark Hageman and D.J. Singh have initiated this program by patterning on the nano- and micron-length scales for topography and near-surface composition.

A second effort in Al's research program is aimed at understanding the onset and growth of mechanically-induced defects, such as crazes, cracks, and cavities in highly-confined nanoparticle-polymer composites. This research specifically targets the design of new materials for photonic, electronic, and catalytic applications where nanoparticles are confined to a single microphase of a block copolymer material. In these materials, the nanoparticles are confined to enhance dielectric contrast between neighboring microphase regions, but their geometry, density, and surface functionality can interfere with the mechanical properties of the surrounding polymer matrix. This interference may lead to an early onset of crazes or local cavities, which will be detrimental to local dielectric and/or transport properties. Beginning with a model polymer system of gold nanoparticles synthesized within a polystyrene-poly(2-vinyl pyridine) block copolymer, Jong-Young is using atomic force microscopy and optical microscopy to quantify craze growth and morphology as a function of nanoparticle geometry and density. The methods developed and the physics learned in these early stages will build a foundation for future research in such areas as the mechanical failure of polyelectrolyte membranes for fuel cell applications.

A third Crosby research interest aims to extend two-dimensional patterns into three-dimensional scaffolds. Here the target is characterization of stress-related properties in biological tissue scaffolds as they transform from a model synthetic network into a biological tissue. The patterning and characterization techniques, as well as his background in the mechanics of soft materials, give Al a unique niche in this field.



Left to right: Mark Hageman, Jong-Young Lee, Assistant Professor Al Crosby, and Andy Duncan.

Al was born in Port Jervis, N.Y., then grew up in Erie, PA. He graduated from McDowell High School in 1990, then attended the University of Virginia, where he received a B.S. in Civil Engineering and Applied Mechanics in 1994. In the labs at UVA he studied the influence of microbially-induced corrosion in the weldments of stainless steel pipes in nuclear power plants. This exposure to materials research sparked Al's interest in materials science. Al also met his wife-to-be, Kerry, at UVA. Kerry did her B.A. in English and Spanish, then an M.S. at Northwestern. She currently teaches 3rd grade at Morgan Elementary in Holyoke, MA., and has brought her class to the PSE Department where they learned "3rd-grade" polymer science through interactive demonstrations with PSE Graduate Student Research leaders.

Al did his Ph.D. program in Materials Science at Northwestern University in Evanston, IL with Professor Ken Shull, where he studied deformation and failure of thin viscoelastic adhesives. Al received several awards for his graduate research including the American Chemical Society John D. Ferry Fellowship and the Adhesion Society Alan P. Gent award. After his Ph.D., Al moved to Washington, D.C. to join the Polymers Division at the National Institute of Standards and Technology as a National Research Council Research Associate. At NIST, Al worked with Drs. Eric Amis and Alamgir Karim on combinatorial methods to quantify polymer adhesion and fracture. As part of this work, new experimental techniques were developed, such as the Multi-lens Contact Adhesion Test (MCAT), patent pending, to quantify the adhesion of over 8000 unique samples in the time required for a single conventional test.

Outside of work, Al is very much enjoying his new life in Amherst. He and Kerry recently moved into their new home in North Amherst, and in what little free time they have they enjoy playing golf, hiking, and exploring the beauty of New England. Al has already received a Faculty Research Grant from the University of Massachusetts and a 3M Non-tenured Faculty Research Award. In addition to his research, Al is teaching *Introduction to Polymer Engineering* to the first-year students this Fall Semester.

*Al Crosby can be reached in his office at 413-577-1313, or by email at [crosby@mail.pse.umass.edu](mailto:crosby@mail.pse.umass.edu).*

## Alumni Profile

**Professor Darrin Pochan**

**University of Delaware**

**Department of Materials Science and Engineering**

Darrin Pochan is currently beginning his fifth year as an Assistant Professor of Materials Science and Engineering at the University of Delaware. Darrin graduated from PSE in 1997 with a Ph.D. from Sam Gido's group, where he studied block copolymer morphology. Darrin then went on to a National Research Council post-doctoral position at the National Institute of Standards and Technology, where he studied polymer thin films as model materials for the microelectronics industry.

The Materials Science and Engineering Department at Delaware has been a unique opportunity for Darrin as a young faculty, considering that the Department was just one year into its existence when Darrin was hired. Darrin was the fifth faculty member hired into the Department and the first Assistant Professor! Since then, the Department has grown to eight, divided 50/50 between polymeric materials and "hard materials." The combination of a new Department and many Assistant Professors provides a very energetic and synergistic working environment, which has contributed to the rapid development of an excellent, modern materials graduate curriculum.

shear, for example by injection through a syringe, or they can dissolve into a low viscosity aqueous solution and reform into a rigid network through changing pH or temperature. These new materials hold significance in biotechnology for tissue engineering and drug delivery. In addition, Darrin's group is preparing composite materials with nanoscopic peptide fibrils and natural clay fillers in biopolymer matrices. These materials contain an important combination of mechanical properties, such as high toughness, strength, and stiffness, as well as biological attributes, in that they are biodegradable *via* hydrolysis or enzymatic reactions. These biopolymers and supramolecular peptide systems are being used for polymer materials construction and provide for innate responsiveness, biological properties, and biodegradability not necessarily found in combination with synthetic polymers. Darrin is working in collaboration with synthetic partners including Professor Tim Deming of the University of California, Santa Barbara, whom Darrin met in the PSE softball league in Amherst. Darrin and Tim are co-PI's on a prestigious National Science Foundation Nanotechnology Interdisciplinary grant, and Darrin was one of eight 2002 recipients of a North American DuPont Young Professor grant for his research in self-assembling polypeptides. In-depth discussion and much more information on Darrin's group is available at [www.udel.edu/mse/research/pochan-research.htm](http://www.udel.edu/mse/research/pochan-research.htm).

**Darrin Pochan (front and center)  
and his group at Delaware**



Darrin's group is currently performing research in several areas of polymer physics and polymeric biomaterials, where biological macromolecules are being used as building blocks for engineering. One focus is to determine how biopolymers, specifically polypeptides, can be used to build materials *via* self-assembly mechanisms. This initial work led to the discovery of new hydrogels that are physically responsive to their environment. They have the ability to heal following

Darrin's wife Beth recently joined the University of Delaware Psychology Department as a faculty member, following three years at Muhlenberg College in Allentown, Pennsylvania. Darrin, Beth, and their 2½ year old son Max, are extremely excited to live and work in the same town, and further excitement is on the way as they await the arrival of Max's twin brothers, expected in late September!!



## Student & Faculty Awards

In each issue we highlight award winners, and here we congratulate awardees within the last 1-2 years. Please let us know if we missed you, and we will include you next time!! Also, we want to add an Alumni Awards section for the Spring 2004 issue - alums, please keep us apprised of your accomplishments!

### Student Awards

**Rebecca Breitenkamp (Advisor - Greg Tew)**

Eugene M. Isenberg Award in support of the integration of science, engineering, and management.

**Gregoire Cardoen (Advisor - Bryan Coughlin)**

The Santos Go Award

**Greg Constable (Advisors - Bryan Coughlin & Alan Lesser)**

NASA Graduate Fellowship

Best Paper Award ANTEC 2002

**Sian Fennessy (Advisor - Dick Farris)**

University of Massachusetts Graduate Fellowship

**Xiaochuan Hu (Advisor - Tom Russell and Sam Gido)**

The Santos Go Award

**Ticora Jones (Advisor - Greg Tew)**

National Institute of Health Graduate Student Fellowship

**Habib Skaff (Advisor - Todd Emrick)**

Poster presentation award at the Spring 2002 American Chemical Society Meeting (*Surface-initiated Growth of Polyolefins from Semiconductor Nanoparticles*).

**Drew Williams (Advisor - Dick Farris)**

Environmental Protection Agency Star Fellowship

### Faculty Awards

**Bryan Coughlin**

National Science Foundation CAREER Award: *Polymer Inorganic Hybrid Materials*

2002 Mettler Toledo Thermal Analysis Grant (with Sam Gido)

Best Paper in the Society of Plastics Engineers Polymer Analysis Division (with Prof. Lesser and Greg Constable).

**Al Crosby**

*University of Massachusetts Research Grant*

3M Non-Tenured Faculty Research Award

**Todd Emrick**

National Science Foundation CAREER Award: *Unique Chemical Functionalization of Nanoparticles for Dispersion, Assembly, and Precise Interfacial Mediation*.  
CUMIRP Exploratory Award: *Novel Amphiphilic Polyolefins Prepared by ROMP of PEG-Substituted Cyclooctene*

**Richard Farris**

The Malcolm Pruitt Award

**Sam Gido**

2002 Mettler Toledo Thermal Analysis Grant (with Bryan Coughlin)

**Frank E. Karasz**

Herman F. Mark Medal

**Alan J. Lesser**

Elected 2004 Chair for the Society of Plastics Engineers.  
Best Paper in the Society of Plastics Engineers Polymer Analysis Division (with Prof. Coughlin and Greg Constable).

**Helmut Strey**

Dillon medal of the American Physical Society

**William J. MacKnight**

American Chemical Society Polymer Division Award

**Thomas P. Russell**

Cooperative Research Award from the American Chemical Society PMSE Division (with Dr. Craig Hawker of IBM)

**Greg Tew**

3M Non-Tenured Faculty Award

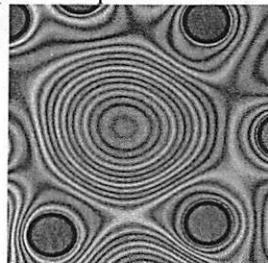
Office of Naval Research Young Investigator Award

*Novel Biomimetics for Anti-Fouling Materials*

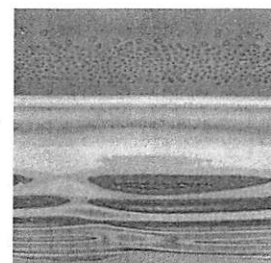
## Polymer Science & Engineering Outreach VISUAL

*Ventures in Science Using Arts Laboratory*, or **VISUAL**, is a recently-launched outreach program of the Materials Research Science and Engineering Center (MRSEC) in PSE. The concept of the program is quite simple yet tremendously valuable for education and promotion of the forefront of scientific and polymer research in PSE to the general public. A "visual gallery" was first initiated by Linda Strzegowski to capture the beauty of scientific research as an art form. Images acquired by graduate students and postdoctoral associates through optical, electron, and fluorescence microscopy, as well as diffraction and theoretical computation, were produced as large color prints that were matted and framed. Taken alone, these images represent important scientific validation of the research findings. However, it became evident that scientists and non-scientists alike appreciated the artistic nature of the images, and many people attracted to the artistry inquired about the origin. Therefore, with each of the images currently in the gallery, there is a description of the phenomenon being observed and the scientific technique used to obtain the image, presented such that a non-technical person may grasp the complexities of the science.

With its initial showing at the Spring 2003 CUMIRP/MRSEC meeting, the gallery was a remarkable success, generating enthusiasm from a wide range of attendees. Coverage of VISUAL has appeared in many local newspapers and in national magazines including *Chemical & Engineering News* and *Optics and Photonics News*. Eastman Kodak Company, a CUMIRP member, has begun an effort to use some of the images in conjunction with their recent printing advances. Another venture for VISUAL is to produce a calendar with images from each of the polymer research groups in the Conte Center. Shown here are two images that exemplify the output of this program. As you will note, the images are given a name that bears that of the researcher and attempts to capture a sense of the image. Please visit the visual website for the latest activity and gallery of images at <http://www.pse.umass.edu/visual>.



*Amanda's Instabilities*



*Tom's layers*

## Graduate Student Research in PSE

We will highlight the research efforts of individual students, small teams of researchers, and collaborative efforts in each issue. Here, Manuel Garcia and Angelo Pedicini briefly describe their soon-to-be completed Ph.D. theses. In addition to contributing outstanding research efforts in the Department, Manuel and Angelo also contribute to the Educational and Outreach programs run through the MRSEC program.

### Manuel Garcia-Leiner

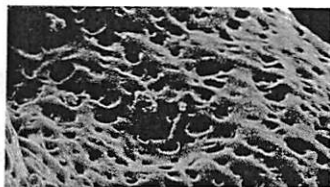
Ph. D. candidate

Research Advisor: Alan J. Lesser

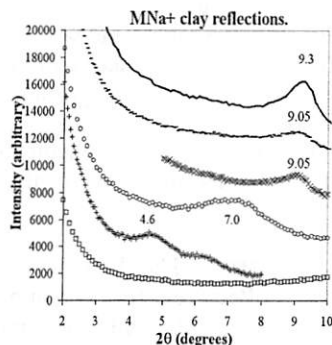
Manuel was the recipient of a Fulbright Scholarship from 1999 to 2002, and more recently received the Perkin Elmer scholarship award through the Society of Plastics Engineers (SPE).

Supercritical carbon dioxide ( $scCO_2$ ) is of interest as an environmentally friendly alternative to organic solvents in many applications. My research is focused on melt and solid-state processing of polymers in  $scCO_2$ -mediated environments. In particular, I have studied the interactions of  $scCO_2$  with solid polymers by analyzing the drawing behavior of high-modulus fibers within this environment. For polymers in the melt, I have designed an extrusion system that I have used to study foaming of polymers in  $scCO_2$ , and obtained interesting results that elucidate the role of  $scCO_2$  as a plasticizer. Such results suggest the possibility of applying this alternative processing technique to high-molecular weight polymers with specific emphasis on commercial polyolefins and fluoropolymers that are well known to be intractable by conventional processing routes.

My latest research targets polymer nanocomposites in  $scCO_2$ , especially related to the effect of  $scCO_2$  on the intercalation or exfoliation processes of inorganic materials within organic polymers. The latest results show that  $scCO_2$  can be used to great advantage in cases where one wants to intercalate purely hydrophobic polymers into hydrophilic materials.



Typical morphology observed in polymers processed in  $scCO_2$ .



Wide-angle x-ray scattering of polyethylene samples processed with  $MNa^+$  clay. Pure  $MNa^+$  clay (—), HDPE/hydrophilic polyolefin blend melt pressed for 15 min (—), HDPE/hydrophilic polyolefin blend melt pressed for 45 min (x), HDPE-10% clay processed in  $scCO_2$  (O), HDPE/hydrophilic polyolefin blend processed in  $scCO_2$  (+), pure hydrophilic polyolefin (□).

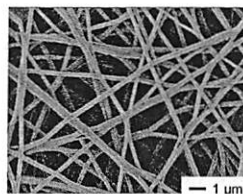
### Angelo Pedicini

Ph.D candidate

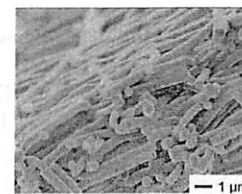
Research Advisors: Richard J. Farris and Alan J. Lesser

Electrospinning is a unique process that uses high electrical potential to spin nanoscale polymer fibers. My research in the field of electrospinning focuses on the mechanical characterization of electrospun thermoplastic polyurethanes. When optimum spinning conditions are achieved, through tuning parameters such as solution viscosity and applied voltage, nonwoven fibrous mats with structural integrity are produced. Inspection of these electrospun 'films' by electron microscopy reveals their fibrous and highly porous nature, with densities approximately one-third that of the bulk material density. The images below represent typical electrospun polyurethane fibers.

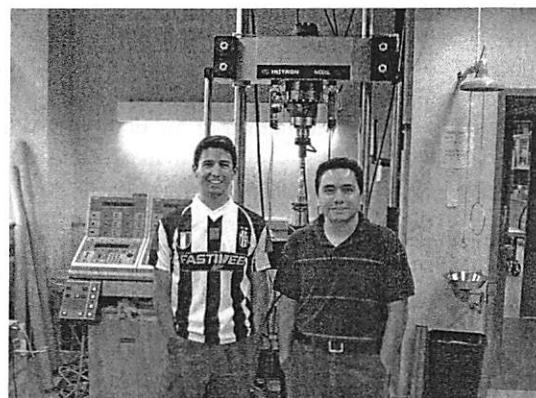
My research on the mechanical behavior of electrospun fiber mats is among relatively scarce mechanical data in the electrospinning community. While my interests also include the process of electrospinning and the morphological characterization of electrospun fibers, a thorough understanding of the mechanical behavior of these materials is of prime importance to their ultimate use in practical applications. In addition, I am applying mathematical modeling techniques to gain further understanding of these materials. I expect to complete my thesis in the summer of 2004. While I would like to work in an industrial research setting, I look forward to an academic career in the longer term.



Typical electrospun polyurethane fibers



Cross-sectional view



Ph.D. students Angelo Pedicini and Manuel Garcia-Leiner

## Thanks to PSE Alumni Contributors!!!

We are extremely grateful for your financial contributions, including corporate matching funds! The PSE Alums listed here, denoted by their *entering class year*, are the initial members of the *PSE Alumni Club!!* We encourage you to join your fellow alums with your contributions!

### \$1,000-\$5,000

Hoe Hin Chuah ('80)  
Richard Larson ('95) (Markem Inc. Match)  
James Capistran ('81)

### \$500-\$999

Sherry Zacharius ('77)

### \$100-\$499

Jeffrey G. Linhardt ('95)  
Vivek Soni ('80)  
Eugene Wilusi ('68)  
Verna Lo Clark ('90)  
Paul Soskey ('79)  
Chester Wu ('67)

## Polymer Reports

Updates from CUMIRP, MRSEC, and the Department

### CUMIRP

#### Center for UMass / Industry Research on Polymers

Many of you surely remember the CUMIRP program, especially those of you who received support for your Ph.D. through CUMIRP-sponsored research agreements. The CUMIRP program was established in 1980 as part of the National Science Foundation Industry/University Collaborative Research Center (IUCRC), and was designed to foster interactions between academia and industry. The Center was specifically designated to PSE at UMASS Amherst, and has the distinction of being the longest running NSF-established IUCRC in the country.

The purpose of CUMIRP is to foster and promote collaborations between industry and polymer research faculty at UMASS Amherst. As expressed in its Mission Statement, CUMIRP will "act as a cross-roads where University research and education meet with Industrial and Government partners in Polymer Science and Engineering at the University of Massachusetts Amherst." As originally established under the NSF-IUCRC charter, the goal of the Center was to develop a self-sufficient, self-sustaining academic/industrial interactive program. The CUMIRP program has long since achieved that goal and, in more recent years, has experienced growth in membership and increased industrial interactions. With over 40 member companies, 20+ faculty participants and 40+ students and post-doctoral fellows supported annually, the Center remains a premier example of an IUCRC and serves as a model for other NSF Centers.

The CUMIRP office is staffed by Jim Capistran (PSE '84) and Jennifer Farner, and serves as a 'one stop, full-service' point-of-contact for those interested in polymer research at UMass Amherst.

For your questions or other interests in CUMIRP, please contact the office by phone at (413) 545-2236 or by email at [cumirp@polysci.umass.edu](mailto:cumirp@polysci.umass.edu).

## MRSEC

### Materials Research Science and Engineering Center

In the Fall of 2002, the PSE Faculty and a number of collaborators learned the positive outcome of their grant application to the National Science Foundation for a Materials Research Science and Engineering Center (MRSEC) focused on polymeric materials. The Center has strong ties to outstanding undergraduate institutions, as well as industrial and government laboratories. The Center builds on a tradition of excellence in multidisciplinary research and education in PSE that has been enabled by 29 consecutive years of support from the National Science Foundation for interdisciplinary research at the frontiers of polymer science.

The center unites the efforts of 34 faculty from 6 departments (Biochemistry, Chemical Engineering, Chemistry, Plant Biology, Physics, and Polymer Science and Engineering) at UMass, and has research collaborations and outreach programs with 12 other institutions. Annual support for 30 graduate students, 3 postdoctoral fellows, 19 undergraduate students and 7 teachers was requested. Eight of the undergraduate students worked in the laboratories of collaborators at the nearby women's colleges, Smith and Mount Holyoke, and 6 are minority students recruited through the New England Board of Higher Education (NEBHE) Science/Engineering Academic Support.

Multi-investigator research programs are organized into three Interdisciplinary Research Groups: *Tailored Interfaces*, *Structured Materials in Supercritical Fluids* and *Aqueous Polymer Assemblies*, as well as two seed programs: *Tailored Crystal Morphologies for Polymer Reinforcement* and *Associative Networks*. The Shared Experimental Facilities were enhanced with new instrumentation and a Nanostructures Laboratory was formed. Outreach programs have connected the Center to Smith, Mount Holyoke, and Harvey Mudd Colleges, and Howard University. Research collaborations link the Center to industrial, government, and academic laboratories, and the budget for the Center was approved at approximately \$2 million per year for 6 years.

## Department

Take a look at the student and faculty awards on page 4 and you will get the sense that the PSE Department is thriving, as our new faculty win prestigious awards, and our tenured faculty continue to shine as established world-wide experts in their fields. The first-year class of students that just entered and started taking classes is once again top-notch, and we are reminded that it is the combined diligence and enthusiasm of our students that have propelled this Department to its position as the top Polymer Department in the U.S.

We are all very excited to maintain closer interactions with our Alums, and look forward to the growth of the Alumni Club!

**Acknowledgements.** The Fall 2003 edition of the PSE Magazine was a collective effort of a number of people within the Department. Special thanks to Andrea Skwirz (Junior, UMass Amherst), assistant to Todd Emrick, and to Jennifer Farner, Jim Capistran, Linda Strzegowski, and Tom McCarthy.

# Photo Gallery



*Dr. Lei Zen and Prof. Bryan Coughlin*



*VISUAL team: Joan Wiener, Linda Strzegowski and Cathy Russell (see page 4)*



*Prof. Tom McCarthy and Dr. Xinquiao Jia at the PSE graduate reception*



*Ph.D. student Jim Goldbach (front right) gives a "slime synthesis" lesson to Chicopee Middle School students.*



*Dr. Ru Feng (Ph.D. with Prof. Richard Farris), pictured with her parents at the PSE graduate reception*



*The "Nano-team"*  
*Back: Profs. Anthony Dinsmore (Physics) and Tom Russel; Front: Prof. Todd Emrick, and Ph.D. students Habib Skaff, and Yao Lin*



*Ph.D. student Lachelle Arnt demonstrates the wonders of polymer science to third grade students from Morgan Elementary School in Holyoke, MA.*



*Ph.D. student Kevin Weir breaks down the fundamentals of Atomic Force Microscopy for high school students in the ASPIRE program students.*



## UMASS Polymer Science & Engineering: FALL 2003 SEMINAR SERIES

- September 5 *Professor Jonathan Rothstein*  
*Mechanical & Industrial Engineering, UMass Amherst*  
*Extensional Flows of Wormlike Micelle Solutions*
- September 12 *American Chemical Society Meeting – New York (no seminar)*
- September 19 *Professor Dick Farris*  
*Polymer Science and Engineering Department, UMass Amherst*  
*Common Misconceptions Regarding the Thermo-Mechanical Behavior of Polymers:*  
*Perception, Theory and Reality*
- September 26 *Professor Brent Iverson*  
*Dept. of Chemistry and Biochemistry, University of Texas, Austin*  
*Title to be announced*
- October 3 *Professor C. Grant Wilson*  
*Dept. of Chemistry and Biochemistry, University of Texas, Austin*  
*Chemistry and Nanostructure Fabrication: A Progress Report*
- October 10 *Dr. Ken Carter*  
*IBM Almaden Research Labs, San Jose, CA*  
*Chemistry at Nano-patterned Interfaces - Surface Modification of Imprinted Polymers*
- October 17 *Professor Ken Dill*  
*Dept. of Pharmaceutical Chemistry, U. Cal. San Francisco*  
*The Rates and Routes of Protein Folding: A new Twist on the Transition State Idea*
- October 24 *Professor Darrin Pochan*  
*Materials Science & Engineering Dept. University of Delaware*  
*Building Responsive Materials via Polypeptide Self-assembly*
- October 31 *Dr. Steve Hahn*  
*DOW Chemical Company, Midland, MI*  
*Fully Hydrogenated Styrene-Based Block Copolymers:*  
*Designing Materials at the Nanometer Scale*
- November 7 *Dr. Newell Washburn*  
*Polymer Division, National Inst. Of Standards and Technology*  
*Combinatorial Screening of Cell-Material interactions*
- November 14 *Professor Karen Trentelman*  
*Detroit Institute of Arts, Detroit, MI*  
*Preserving the Past: Art and Science at the Detroit Institute of Arts*
- November 21 *Professor Nitash Balsara*  
*Dept. of Chem. Engineering, University of California Berkeley*  
*Does Conventional Nucleation Occur During Phase Separation in Polymer Blends?*
- November 28 *Thanksgiving Week (no seminar)*
- December 5 *Professor Rob Corn*  
*Department of Chemistry, University of Wisconsin*  
*Monitoring Bioaffinity Interactions with Surface Plasmon Resonance*
- December 12 *Richard McCullough, Carnegie Mellon*  
*Cheap, Processable, and Stable: New Conductive Block Copolymer Nanostructures*

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