

PMSE NEWS

Polymeric Materials: Science and Engineering Division of the American Chemical Society

SPRING 2005

Message From Our Chair, Benny Freeman



Dear PMSE Members and Friends,

It is a distinct honor to serve as the Chair of the PMSE Division of the American Chemical Society in 2005. I would first like to thank my predecessor, Dr. Jay Dias, and his recent predecessors, Dr. Paul Valint and Dr. Larry Charbonneau, who have guided PMSE through a period of rapid change and have poised the division for future growth. As you may know, we have virtually completed the transition of the PMSE Preprints to electronic medium delivery. This

transition has been very smooth, and it has involved the work of a number of current and former PMSE executive committee members. Jay and Paul have launched an initiative in long range planning for the division that has provided valuable feedback to help guide our activities into the future. We hope that this committee and feedback from members will enable PMSE to continue to be a premier outlet for technical information regarding polymeric materials.

Arguably, the most visible product of PMSE is the scientific program at the national meetings. Our program chairs, Dr. Tim Bunning, Dr. Darin Pochan, and Dr. Zhenan Bao, have done an excellent job in assembling a very exciting program for the spring meeting in San Diego, and, on behalf of the Division, I offer them our thanks for this strong program. As PMSE seeks to remain an outstanding location for the presentation of new research and new research activities related to polymer and polymer based materials, we need help from you, the membership, to understand and program in areas that allow us to maintain this leadership. In this regard, we strongly invite and encourage you to provide input to our program chairs with your thoughts about topics that should be addressed in future PMSE sessions. Moreover, we strongly encourage you to consider becoming involved in PMSE and organizing a symposium in a cutting edge area of research. Information about symposia that are currently scheduled and contact information for our program committee is available at the meetings section of the PMSE web site:

<http://membership.acs.org/P/PMSE/meetings/future.html>

The spring meeting is always a busy one for PMSE, and this spring in San Diego will be no exception. We have several awards that will be part of the programming. Additionally, we have our traditional awards reception and awards luncheon to honor PMSE awardees and PMSE fellows, and you are invited and encouraged to attend these events. The awards reception can be attended at no charge, and it is held on Monday evening of the spring meeting. Tickets to attend the Monday awards luncheon can be purchased in advance or during registration at the meeting or at the PMSE table at the meeting. We invite you to attend both of these events and to help us celebrate the accomplishments of our award winners. The social and technical program organized by PMSE would not occur without the concerted effort of the vice-chair, who makes all on-site arrangements for the technical program and social events. In this regard, I would like to thank Dr. Ron DeMartino on behalf of the division for his work in organizing these events at the upcoming San Diego meeting. Additionally, our administrative efforts continue to be handled very efficiently by Ms. Eileen Ernst, and I would like to thank Eileen for her contributions.

A critical component to maintaining the relevance and future growth of PMSE, and, indeed, polymer programming within the American Chemical Society, hinges on engaging and involving younger members or potential members of the division to participate in its activities. In this regard, we have recently begun hosting a joint hospitality suite with the Polymer division, and it is typically held on Tuesday evening after the joint POLY/PMSE poster session. Information about this year's hospitality suite, which is open to all members and potential members and where students are particularly encouraged to come to meet officers, awardees and other members of the polymer community, will be available at the PMSE and POLY membership desks at the national meeting. Please stop by the desk to get information about these events, and please join us and encourage your students and younger colleagues to join us to build connections between current and future generations of PMSE participants and leaders.

At several recent meetings we have hosted, on a pilot basis, a joint discussion/networking area with the Polymer division. This area has typically been a room near the technical sessions where folks who are attending or participating in POLY and PMSE programming can go to sit down and chat, have a cup of coffee and, in general, relax, network, and pursue business outside the

continued on page 11



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Program For San Diego

March 13-17, 2005

Application of Polymers in Manufacturing of Integrated Circuits. Alex Tregub, Intel, Mail Stop SC3-06, 2200 Mission College Blvd., Santa Clara, CA 95054-1549, (408) 653-9408, alexander.tregub@intel.com.; Galina Z. Goloverda, Chemistry Department, Xavier University, 1 Drexel Drive, New Orleans, LA 70125, (504) 520-5417, Fax: (504) 520-7942 gzglolove@xula.edu

Bionanotechnology: The Interface Between Biology and Polymer Science. Rajesh R. Naik, Air Force Research Laboratory, AFRL/MLPJ, Bldg. 651, 3005 Hobson Way, Wright-Patterson AFB, OH 45433, (937) 255-3808, x3270, FAX (937) 255-1128, rajesh.naik@wpafb.af.mil; Kimberly Hamad-Schifferli, MIT, Dept. of Mech. Engg., Rm. 3-461-B, 77 Massachusetts Ave., Cambridge, MA 02139, (617) 253-6071, FAX (617) 258-6156, schiffer@mit.edu; Hiroshi Matsui, The City Univ. of NY, Dept. of Chem. at Hunter College and Graduate Ctr., 695 Park Ave., New York, NY 10021, (212) 650-3918, FAX (212) 772-5332, hmatsui@hunter.cuny.edu

Confinement Effects on Relaxation Properties of Polymers. Peggy Cebe, STC-208, Tufts Univ., Physics Dept., 4 Colby St., Medford, MA 02155, (617) 627-3365, FAX (617) 627-3744, peggy.cebe@tufts.edu; Jim Runt, Penn State Univ., Dept of Mats. Sci & Engg., 101 Steidle Bldg., University Park, PA 16802, (814) 863-2749, runt@matse.psu.edu

Cooperative Research Award. Brian C. Benicewicz, Rensselaer Polytechnic Inst., NYS Center for Polymer Synthesis, Cogswell Laboratory, Troy, NY 12180, (518) 276-2534, FAX (518) 276-6434, benice@rpi.edu

Polymer Nanocomposites. Richard Vaia, Air Force Research Laboratory, Materials & Manufacturing Directorate, AFRL/MLBP, Bldg. 654, 2941 P St., Wright-Patterson AFB, OH 45433-7750, (937) 255-9184, FAX (937) 255-9157, richard.vaia@wpafb.af.mil; R.

Krishnamoorti, Univ. of Houston, Dept. of Chem. Engg., 4800 Calhoun, Houston, TX 77004, (713) 743-4312, FAX (713) 743-4323, ramanan@bayou.uh.edu

Polymeric Semiconductors for Thin-Film Electronics. Michael Chabynec, Palo Alto Res. Ctr., 333 Coyote Hill Rd., Palo Alto, CA 94304, 650-812-4169, mchabynec@parc.com; Lynn Loo, The Univ. of TX at Austin, Dept. of Chem. Engg., 4.422 CPE Bldg., C0400, Austin, TX 78712, (512) 471-6300, FAX (512-471-7060, lloo@che.utexas.edu

Polymers & Medical Devices. Shirang V. Ranade, Corporate R&D, Boston Scientific Corp., 1 Boston Scientific Pl., Natick, MA 01760, (508) 652-5143, FAX (508) 647-2405, ranades@bsci.com; Signe E. Varner, Doheny Eye Inst., Keck School of Medicine, USC, 1450 San Pablo St., Ste 3600, Los Angeles, CA 90033, varner@usc.edu

Toward Noninvasive Delivery and Diagnostics: Proteins, Genes and Cells. Steven Dinh, Emisphere Technologies, Inc., 765 Old Saw Mill River Rd., Tarrytown, NY 10591, (914) 785-4756, sdinh@emisphere.com; John D. DeNuzzio, Becton Dickinson Technologies, 21 Davis Dr., Research Triangle Park, NC 27709, (919) 597-6127, john_d_denuzzio@bd.com

General Papers/New Concepts in Polymeric Materials. Ron DeMartino, 11 Mandeville Dr., Wayne, NJ 07470, (973) 696-8839; rdemart@verizon.net

Joint PMSE/POLY Poster Session: General Papers/New Concepts in Polymeric Materials. Ron DeMartino, 11 Mandeville Dr., Wayne, NJ 07470, (973) 696-8839 rdemart@verizon.net

Visit <http://membership.acs.org/P/PMSE/meetings/> for:

WASHINGTON August 28 - September 2, 2005

ATLANTA March 26-31, 2006

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Sixth Class of PMSE Fellows

The American Chemical Society Division of Polymeric Materials: Science and Engineering (PMSE) is pleased to announce two distinguished PMSE members as the sixth class of Fellows.

Eric J. Amis • David J. Lohse

Dr. Amis and Dr. Lohse will be inducted as the sixth class of PMSE Fellows during the Awards Lunch at the San Diego ACS Meeting on Monday, March 14th. PMSE is pleased to welcome this distinguished group of polymer scientists and engineers to the ranks of fellows.



Dr. Eric J. Amis



Dr. David J. Lohse

Dr. Eric J. Amis has been Chief of the Polymers Division of the National Institute of Standards and Technology since May 1999. Before joining NIST in 1995 to lead the Polymer Blends and Processing Program, Amis spent 11 years on the faculty in physical chemistry at the University of Southern California. Prior to that he completed postdoctoral training at the University of Wisconsin and as a National Research Council Associate at NIST's predecessor, the National Bureau of Standards. He received his Ph.D. in Chemistry from University of Wisconsin-Madison and B.S. in Chemistry from Willamette University, Salem, Oregon. From 1992 to 2002 he was the Editor of the Journal of Polymer Science: Polymer Physics Edition. He is a Fellow of the American Physical Society (1992) and a past Chair of the APS Division of Polymer Physics (1998). In 2002 he was awarded the Silver Medal from the US Department of Commerce for Leadership in advancing new technical programs in the Polymers Division at NIST. Amis has chaired three Gordon Research Conferences: Macromolecular Dynamics, Polymer West, and Combinatorial and High-Throughput Materials Science (as co-founder). His research is primarily in the areas of solution rheology combined with light, neutron and X-ray scattering methods to investigate the physics of complex systems such as biomembranes, polyelectrolytes, associating polymers, gels, polymer crystallization, and dendritic polymers. More recently, he has initiated a program to apply combinatorial and high throughput methods to materials physics and biomaterials, which led to the establishment of both the NIST Combinatorial Methods Center and a major NIST initiative in metrology for tissue engineering.

Dr. David J. Lohse received B.S. degrees in both Physics and Computer Science from Michigan State University in 1974, and a Ph. D. in Materials Science from the University of Illinois in 1978. He then spent two years at the National Bureau of Standards in Gaithersburg, MD under an NSF-NRC Fellowship, working on the theory of polymer solutions with Isaac Sanchez. Since then he has worked for Exxon Mobil Corporation, first in the Long Range Polymer Research Group of Exxon Chemical Co., and since 1987 in what are now the Corporate Strategic Research Labs of ExxonMobil Research & Engineering Co. in Annandale, NJ. His current research focuses on the thermodynamics of mixing polymer blends, neutron scattering from polymers, the use of block and graft copolymers to enhance blend compatibility, the control of rheology by molecular architecture, nanocomposites, and the application of such knowledge to develop improved polymer products. His research has resulted in over 80 publications (including a book on "Polymeric Compatibilizers" written in 1996 with Sudhin Datta of ExxonMobil Chemical Co.) and more than fifteen patents. He has also served the PMSE division of the American Chemical Society in several capacities. Among these are Program Chair from 1991-94, Secretary in 1995, Chair in 1998, and chair of the new Fellows Committee from 1999-2003. In 2003 he began a term as Councilor for PMSE. He was elected a Fellow of the American Physical Society in 2000.

ICI Student Award Finalists



Left to right: Justin Martin, Wageesha Senaratne, Jiaxing Huang, Dongwook Jung, Yufeng Richard Liu, Christopher Ellison

The six finalists presented at the ICI Symposium 228th ACS National meeting in Philadelphia, PA.

Dongwook Jung - North Carolina State University - "High modulus nylon 66 fibers through Lewis acid-base complexation to control hydrogen bonding and enhance drawing behavior" Dongwook Jung, Richard Kotek, N. Vasanthan, A. E. Tonelli

Richard Y. F. Liu - Case Western Reserve University - "Interphase materials by forced-assembly of glassy polymers" Richard Y. F. Liu, Anne Hiltner, Eric Baer

Jiaxing Huang - University of California, Los Angeles (UCLA) - "Polyaniline nanofibers: Facile synthesis, chemical sensors and nanocomposites" Jiaxing Huang, Shabnam Virji, Bruce H. Weiller, Richard B. Kaner

Wageesha Senaratne - Cornell University - "Biomolecular patterned surfaces by electron beam lithography" Wageesha Senaratne, Prabuddha Sengupta, Vladimir Jakubek, Barbara Baird, Christopher K. Ober

Christopher J. Ellison - Northwestern University - "Can the impact of nanoconfinement on T_g be explained by interfacial effects?" Christopher J. Ellison, John M. Torkelson

Justin J. Martin - Binghamton University - "Modification of conducting polymer thin films by self-assembled transition metal surfaces" Justin J. Martin, Steven M. Hira, Frederick Ochanda, Jean P. Gaffney, David M. Sarno, Wayne E. Jones Jr.

The award consists of \$1600 and a plaque, which will be presented to the winner at the PMSE Awards Luncheon at the 229th ACS National Meeting in San Diego. John S. Thomaidis is the ICI Student Award Organizer.

Philadelphia Ford Travel Grants Awarded

The Division of Polymeric Materials: Science and Engineering (PMSE) is pleased to announce the winners of the Ford Travel Grant for the Fall 2004 ACS Meeting in Philadelphia, **Leslie Passeno** and **Sian Fennessey**. This competitive award is sponsored by the Ford Motor Company and provides a certificate and \$500 in travel assistance to graduate student women and underrepresented minorities to present their research at national ACS meetings.

Ms. Passeno's research entails the synthesis and characterization of linear-dendrimer diblock copolymers. Particular emphasis is placed on strategies to determine the influence of the dendrimer generation and PEO chain length on the behavior of the copolymer in dilute solution. The ultimate goal of the project is to control the morphology of these diblock copolymers in solution, or at an interface, by altering the chemical environment of the system.

Ms. Fennessey's research is focused on electrospinning for the preparation of continuous nanofiber reinforcements in composite materials. Efforts are directed towards the fabrication and post-treatment of polyacrylonitrile precursor carbon fibers, and determining the mechanical properties of their yarns. The goal of the research is to mechanically evaluate these high aspect ratio carbon nanofibers and to determine their reinforcement effect in thin films relative to commercially produced fibers.



Ford Travel Grant Winners, Leslie Passeno and Sian Fennessey

2005 Cooperative Research Award



Cheng



Harris



Winker

The 2005 winners of the Cooperative Research Award in Polymer Science and Engineering presented by the American Chemical Society's Division of Polymeric Materials: Science and Engineering (PMSE) are **Professor Frank W. Harris**, Distinguished Professor of Polymer Science and Biomedical Engineering and Director, Maurice Morton Institute of Polymer Science at the University of Akron, **Professor Stephen Z. D. Cheng**, Robert C. Musson Trustees Professor of Polymer Science, and Chair, Department of Polymer Science at the University of Akron, and **Dr. Bruce K. Winker**, Project Leader for the Organic Compensator Materials program at Rockwell International, Thousand Oaks, CA. Prof. David Schiraldi, Chair of the PMSE Cooperative Research Award Committee, announced the award, which is endowed by the Eastman Kodak Company, and has been presented annually since 1992.

The group of Professor Harris, Professor Cheng, and Dr. Winker won the 2005 award for their highly productive and sustained collaboration in a range of areas, especially for the development and large scale commercialization of negative birefringent polyimide compensator materials used in liquid crystalline displays. These compensators are key components in displays used in avionics and large screen televisions. The collaborative effort between the award winners was catalyzed by a National Science Foundation Science & Technology Center on Advanced Liquid Crystal Optical Materials (ALCOM) in which Professors Harris and Cheng were principal investigators, and Dr. Winker was an industrial partner. The collaboration, which began shortly

after ALCOM's creation in 1991, generated numerous patents and publications throughout the decade which followed, and resulted in both the basic science associated with polyimide optical materials as well as development and commercial exploitation of the resultant inventions.

Negative birefringence occurs in a material when its in-plane refractive index is greater than its out-of-plane refractive index. The polymers developed by this team required synthesis of new monomers and polymers and required processability using common commercial solvents. Professors Harris and Cheng determined that the polyimide molecular structures could be used to control the extent of in-plane polymer chain orientation, which in turn controlled the degree of negative birefringence of the films. Dr. Winker developed a film coating process which produced the high quality thin films necessary for commercial applications, as well as a flexible laminate which facilitates the manufacture of the desired structures. The compensator films resulting from this collaboration solve the major problem of loss of contrast in off-angle viewing of liquid crystal displays, and are therefore an enabling technology for this important industry.

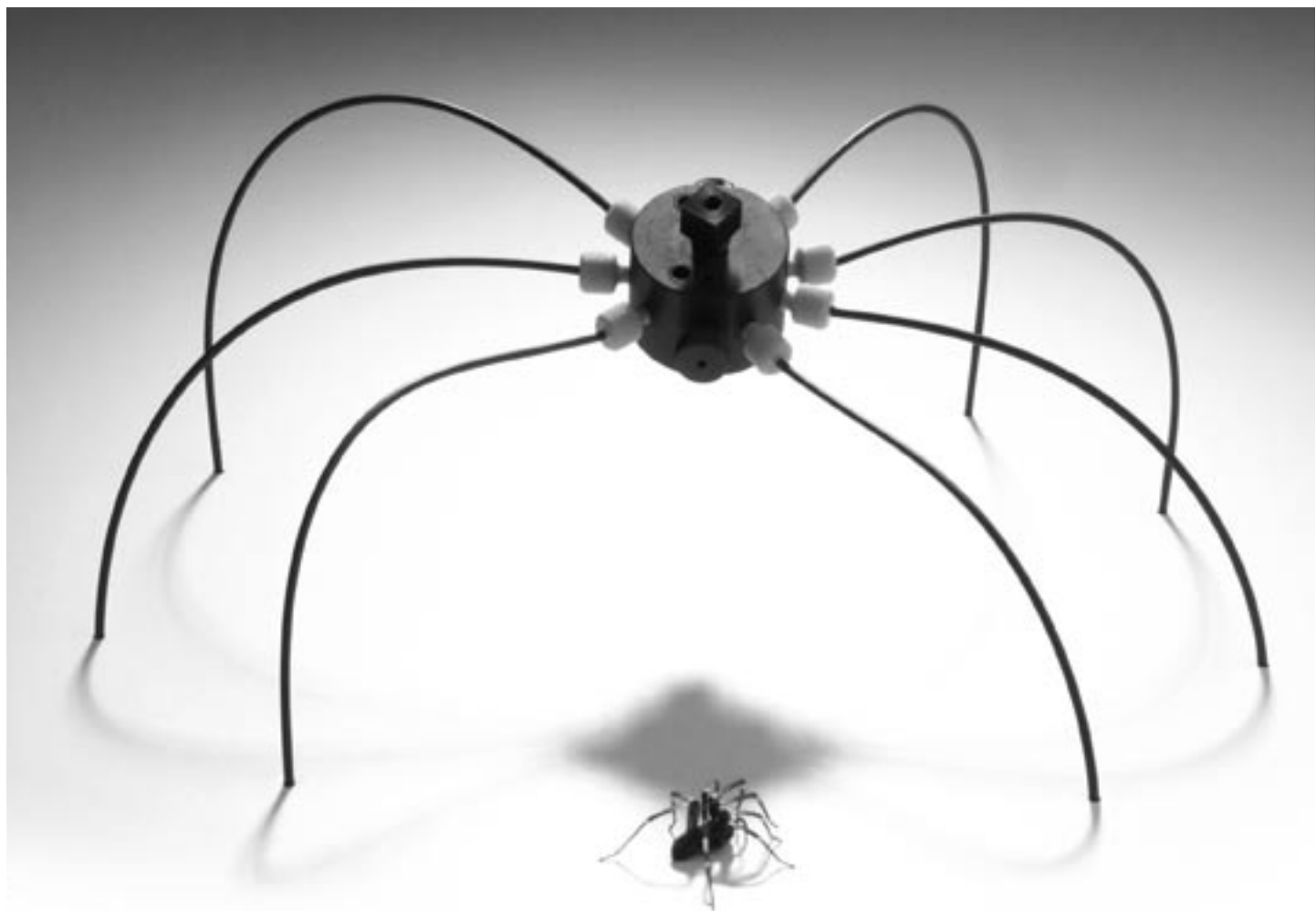
The award, which includes a \$3,000 prize, will be presented at PMSE's awards luncheon and will be recognized by the Symposium "Polymers for Optical Films and Advanced Materials: Cooperative Research Award honoring Frank W. Harris, Stephen Z. D. Cheng, and Bruce K. Winker" at the 229th American Chemical Society meeting in San Diego, California (March 2005).

Doolittle Award Winners

The Arthur K. Doolittle Award, established by the Union Carbide Corporation, is given to the authors of an outstanding paper presented before the Division at each national meeting of the ACS. The winners will be recognized at the Awards Luncheon in San Diego.

The winners from papers presented at the Spring 2004 meeting in Anaheim are J. R. Heath, D. Steuerman, Y. Luo (Cal Tech), H. Tseng, S. Vignon and J. F. Stoddart (UCLA), for their paper "Molecular Mechanics and Molecular Electronics."

The winners from papers presented at the Fall 2004 meeting in Philadelphia are Takuzo Aida and Kazushi Kinbara (The University of Tokyo), for their paper "Functional Nanomaterials by Supramolecular and Macromolecular Approaches."



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**Tess Award winner Omkaram Nalamasu at the Tess Award Symposium in Philadelphia
L to R, Shu Yang, Jay Dias, Omkaram Nalamasu, Elsa Reichmanis, Frank Houlihan**



**PMSE Information Table at the Fall 2004 Philadelphia ACS Meeting
Membership Chair Lisa Baugh and Chair Elect Ron DeMartino at the table
along with convention center employee at left.**

2005 PMSE Distinguished Service Award

The recipient of the 2005 American Chemical Society (ACS) Division of Polymeric Materials: Science and Engineering (PMSE) Distinguished Service Award is, **Dr. Larry F. Thompson**. Larry has served the PMSE Division and the ACS for over 20 years. He served as the Division's Chair and held many other positions including Councilor from 1985 through 1992. He was a member of the ACS Board of Directors from 1992 through 1996.



Larry F. Thompson is Managing Partner of the Intellectual Property Solutions and Services, LP (IPSS-LP) Consulting Company. He has worked in the semiconductor industry for 35 years, in the areas of materials research and semiconductor process development at Bell Laboratories, as well as in the semiconductor equipment industry at Integrated Solutions and Ultratech Stepper. He has held senior management positions since 1994, including CTO of Integrated Solutions, and he is a member of the board of directors. At Ultratech Stepper he served as Senior Vice President of Technology and President of the Ultrabeam Lithography Division. Dr. Thompson received his B.S. degree in Chemistry and his M.S. degree in Chemistry/Nuclear Engineering from Tennessee Technological University. He holds a Ph.D. in Chemistry/Chemical Engineering from the University of Missouri. He has over 160 publications and holds 28 patents in the areas of semiconductor processing and materials engineering. He is a member of the National Academy of Engineering.

As a research engineer at Bell Laboratories, he invented, developed, and introduced into manufacture several polymeric resist materials used to produce chromium masks, including PBS and COP. He managed the group responsible for developing chemically amplified deep-UV resists and was instrumental in developing the 248nm lithography technology. He won the Semiconductor Equipment and Materials Industry Association (SEMI) Award for Innovation for this contribution. He has worked in many areas in semiconductor processing, including advanced lithography, plasma processing, and new materials. During his career at Bell Laboratories, he held several management positions in Research and Development. He worked with the Intellectual Property Division and was instrumental in several significant licensing agreements including electron beam lithography for mask fabrication and deep-UV resist materials.


After leaving Bell Labs he joined Integrated Solutions Inc. (ISI) and served as the Chief Technical Officer and a member of the Board of Directors. He led the effort to license the advanced XLS stepper technology from General Signal Corporation. At ISI he managed the design and introduction into manufacture of the world's first 193nm deep UV lithography stepper. In 1997, he was instrumental in the successful sale of ISI to Ultratech Stepper where he served as Senior Vice President of Advanced Technology and President of the Ultrabeam Lithography Division. He currently serves on the Ultratech Technical Advisory Board, the Strategic Advisory Board of DuPont Electronic Materials Division, and Brewer Science Board.

In June of 2002, he became CEO and President of the New Jersey Nanotechnology Consortium and was responsible for setting up an independent, for-profit company to capitalize on the Advanced Semiconductor Development Laboratory facilities and personnel of Lucent Technologies, Bell Laboratories. He currently is president of his own consulting business in the area of intellectual property, semiconductor materials, equipment and processing.

The Distinguished Service Award will be presented during the Awards Luncheon Monday at the San Diego ACS Meeting.

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Chair, continued from page 1

confines of the session rooms. We plan to have this joint POLY/PMSE meeting room available to you again at the upcoming national meeting, and we encourage you to take advantage of it. Information about its location and hours of operation will be available at the PMSE or POLY desks at the national meeting.

Finally, the PMSE division can only continue to thrive as a result of the efforts of the volunteers who staff the PMSE desk at the national meeting, organize and execute the technical programming, manage the awards process, keep track of division activities and educational efforts and so many other activities that are required to allow the division to function effectively. We need volunteers to continue these activities, so I strongly encourage you to contact any member of the membership team or to drop by the PMSE

desk during the national meeting and let us know of your interest in becoming involved with PMSE to help carry the division forward into the future. Contact information for all of the PMSE officers is available on the PMSE web site:

<http://membership.acs.org/P/PMSE/>

I look forward to seeing you and visiting with you in San Diego.

Benny D. Freeman
PMSE Chair

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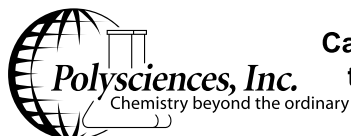
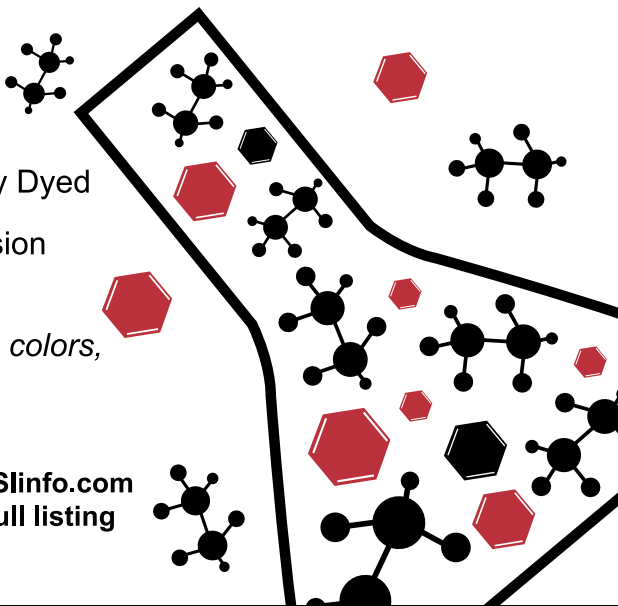


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