

PMSE NEWS

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

FALL 2009 - ELECTION ISSUE

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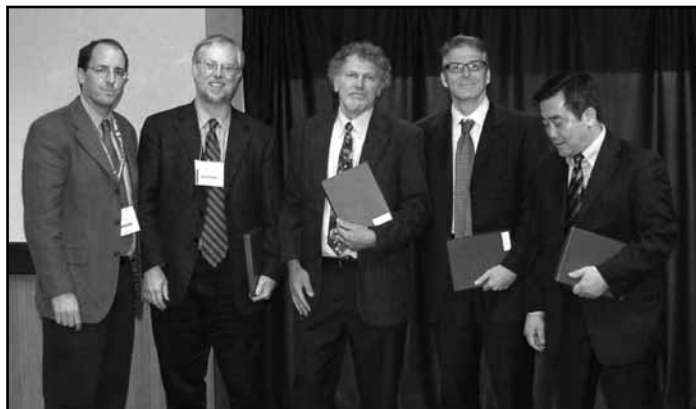
Ballot Enclosed

Don't forget to vote!



PMSE Awards at the Spring National Meeting

PMSE Fellows Inducted at Awards Luncheon



L to R: PMSE chair Bryan Coughlin with the Ninth Class of PMSE Fellows Chris Ober, Garth Wilkes, Craig Hawker, Alex Jen (and not pictured, Lon Mathias)

Cooperative Research Award Symposium

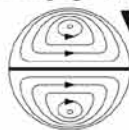


Front Row from L to R: James Hedrick and Robert Waymouth, Co-Recipients of the 2009 Cooperative Research Award
Back Row from L to R: Symposium speakers Geoff Coates, Marc Hillmyer, Robert Grubbs, Chris Bielawski



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Program for the SAN FRANCISCO ACS National Meeting

March 21-25, 2010

100+ Years of Plastics. Leo Baekeland and Beyond. (Co-sponsored with HIST, HIST is primary.) E. Thomas Strom, University of Texas at Arlington, Arlington, TX, tomstrom_at_juno.com.

ACS Award in Applied Polymer Science: Symposium in Honor of Andrew J. Lovinger. Stephen Z. D. Cheng, College of Polymer Science and Engineering, The University of Akron, scheng_at_uakron.edu.

Cooperative Research Award Symposium. Kurt N. Wiegel Department of Chemistry, University of Wisconsin Eau Claire, wiegelkn_at_uwec.edu.

Emerging Technologies for Polymeric Coatings. Jamil A. Baghdachi, College of Technology, Eastern Michigan University, jamil.baghdachi_at_emich.edu.

General Papers/New Concepts in Polymeric Materials. Todd Emrick, University of Massachusetts, Department of Polymer Science and Engineering, tsemrick_at_mail.pse.umass.edu.

Green Chemistry, Materials and Sustainability (invitation only). Christopher Soles, National Institute of Standards and Technology, christopher.soles_at_nist.gov; Todd R. Younkin, Intel Corporation, RA3-252, 2501 N.W. 229th Avenue, Hillsboro, Oregon 97124, 971-214-9973, todd.r.younkin_at_intel.com; Jeffrey Pyun, Department of Chemistry, University of Arizona, jpyun_at_email.arizona.edu.

Joint PMSE/POLY Poster Session. Todd Emrick, University of Massachusetts, Department of Polymer Science and Engineering, tsemrick_at_mail.pse.umass.edu.

Nanostructured Materials for Photovoltaics and Solar Electric Power: Synthesis, Characterization and Device Fabrication. (Co-sponsored with PHYS,

PMSE is primary.) Oliver L. A. Monti, Department of Chemistry, University of Arizona, monti_at_email.arizona.edu.

Nanostructured Materials from Supramolecular Interactions. Rachel K. O'Reilly, Department of Chemistry, University of Warwick, r.k.o-reilly_at_warwick.ac.uk

Peptides and Polypeptides: From Synthesis and Characterization to Application. Jianjun Cheng, Department of Materials Science and Engineering, University of Illinois at Urbana-Champaign, jianjunc_at_illinois.edu. Jamie Messman, Center for Nanophase Materials Sciences, Oak Ridge National Laboratory, messmanjm_at_ornl.gov.

PMSE Young Investigator Symposium. Christopher Soles, National Institute of Standards and Technology, christopher.soles_at_nist.gov; Todd R. Younkin, Intel Corporation, todd.r.younkin_at_intel.com; Jeffrey Pyun, Department of Chemistry, University of Arizona, jpyun_at_email.arizona.edu.

Synthesis and Self-Assembly Approaches to Nanostructured Materials. Eugene Zubarev, Department of Chemistry, Rice University, ez_at_rice.edu

The First International Symposium on Polybenzoxazine. Hatsuo Ishida, Department of Macromolecular Science and Engineering, Case Western Reserve University, hxi3_at_cwru.edu.

**2010 Fall National Meeting:
BOSTON August 22-26**

Program Committee

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ACS Applied Polymer Science Award in Honor of Andrew J. Lovinger



Andrew J. Lovinger, winner of the **2010 ACS Award in Applied Polymer Science**, is recognized "for his research contributions, particularly through structure-property elucidation, to the development of polymeric materials for electronic and other technological applications".

Andy Lovinger is currently the Polymers Program Director in the Division of Materials Research of the National Science Foundation, where he has served since 1995. He spent most of his career (1977-1995) at Bell Laboratories, where he was Distinguished Member of Technical Staff and Head of the Polymer Chemistry Research Department (1985-1994). Since moving to NSF in 1995 he continued part-time research at Bell Labs through 2007 when the parent Company (Alcatel-Lucent) discontinued all research in chemistry and materials. He started at Bell Labs in 1977 right after receiving his doctorate in chemical engineering and applied chemistry from Columbia University (where he also received his BS and MS degrees in the same discipline).

Lovinger's research has been focused on discovering and controlling the structure, crystallization, morphology, and phase transitions of important polymeric materials and correlating these with properties aimed at both fundamental understanding and optimized performance. His research has been recognized by a number of other major distinctions, including election to the National

Academy of Engineering (2004), the Polymer Physics Prize of the American Physical Society (2003), Fellowship in the American Association for the Advancement of Science (1988), and the Dillon Medal of the American Physical Society (1985).

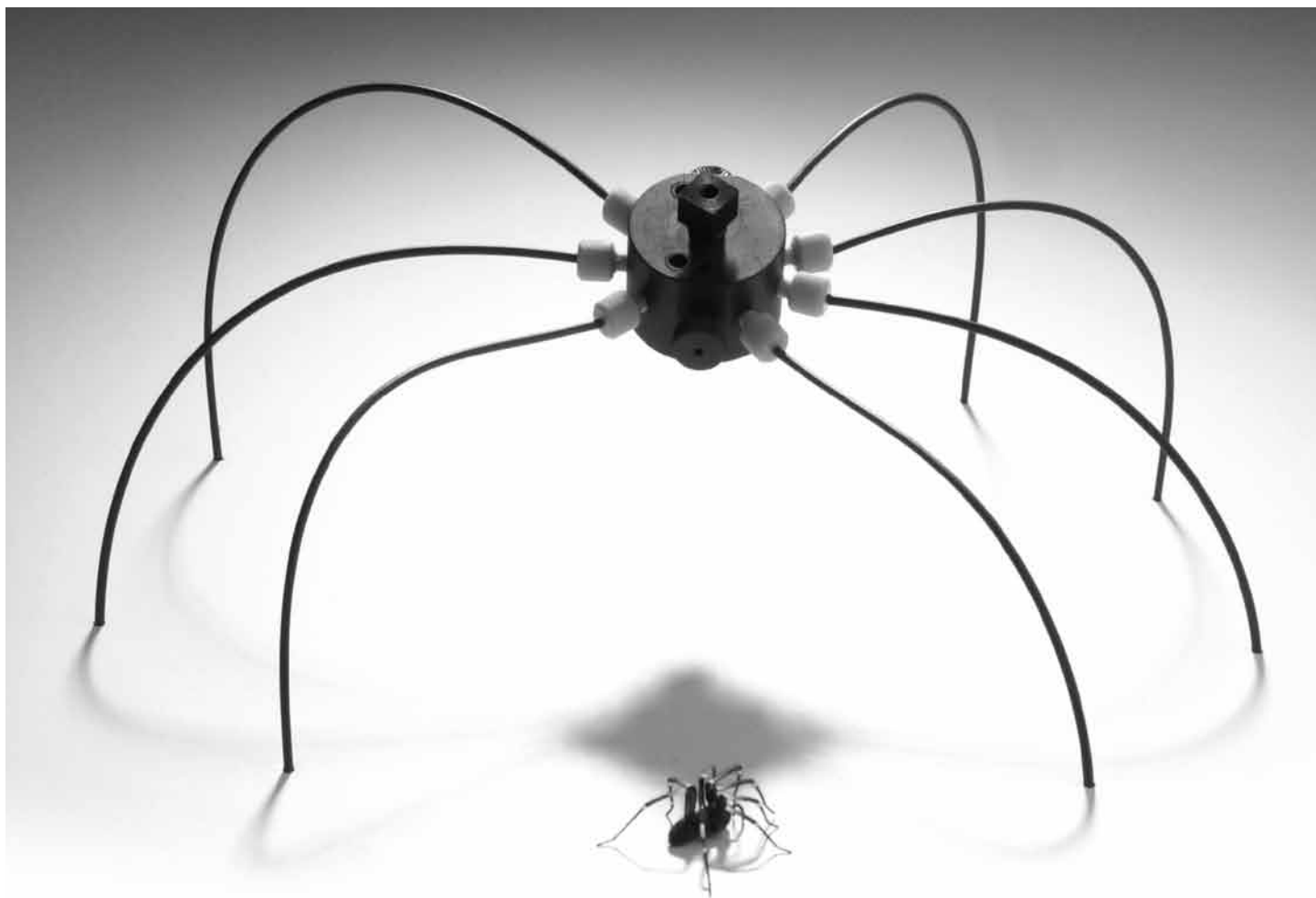
Lovinger's most recent research has been in the area of "plastic electronics" where he provided the first structural and morphological evidence for their substrate orientations, explained their charge transport properties on that basis, and contributed to the tremendous growth in "electronic paper" applications. In 1996, together with Z. Bao and A. Dodabalapur, they published the first report on regioregular poly(3-hexyl thiophene) (P3HT) and its molecular orientation on device substrates [*Appl. Phys. Lett.* **1996**, 69, 4108]. This paper has been cited over 700 times and regioregular P3HT is now the major workhorse of polymeric semiconductors. With Z. Bao and H. E. Katz they developed and studied many families of organic semiconductors. Two highly promising soluble and air-stable n-type organic semiconductors with high electron mobility were reported in 1998 and 2000 and have jointly garnered over 700 citations [*JACS* **1998**, 120, 207 and *Nature* **2000**, 404, 6777].

A second major research area has been ferroelectric polymers ("smart materials"). His work on poly(vinylidene fluoride) (PVDF) with T. Furukawa, G. T. Davis, and M. G. Broadhurst proved that this was the first ferroelectric polymer and demonstrated its Curie transition. He provided the first morphological studies of this polymer and explained its phase transformations. He also discovered a number of unprecedented phenomena, including ferroelectric-to-paraelectric transformations in PVDF copolymers induced not by heating but by electron irradiation [*Macromolecules* **1985**, 18, 910]. This new effect was used by subsequent researchers to demonstrate "giant electrostriction" in this polymer. Other unique phenomena he discovered are "backwards-growing" solid-state polymorphic transformations [*Polymer* **1980**, 21, 1317] and inhomogeneous thermal degradation based on crystallographic phase [*Macromolecules* **1980**, 13, 989]. Lovinger also wrote the definitive reviews on ferroelectric polymers: His article in *Science* **1983**, 220, 1115 [over 300 citations] and his book chapter in *Developments in Crystalline Polymers* (D. C. Bassett, Editor), Applied Science Publishers **1982** [over 400 citations] still continue to be quoted extensively.

A third major field that Lovinger opened up in collaboration with B. Lotz was the solid-state structure and properties of syndiotactic polypropylene. They discovered that the decades-long universally accepted crystal structure dating from the classic studies of Natta and Corradini was inapplicable, demonstrated the correct structure, discovered that it involves fully antichiral chain packing, interpreted this on steric reasons, and explained the existence and type of structural disorder [*Macromolecules* **1988**, 21, 2375 and *Macromolecules* **1993**, 26, 3494]. These papers have been cited about 200 times each. Lovinger and Lotz also produced the first regular crystals of this polymer, elucidated their morphology, and explained their highly anisotropic thermal expansion which leads to extensive transverse fractures.

Another major area of Lovinger's contributions is the directional solidification technique. With C. C. Gryte he showed that essentially infinitely long and unidirectionally oriented spherulites of crystalline polymers can be grown by crystallization within an imposed sharp temperature gradient [*Macromolecules* **1976**, 9, 247]. He demonstrated this through the creation of large films of directionally solidified beta-phase isotactic polypropylene in a classic paper [*J. Polym. Sci.-Polym. Phys. Ed.* **1977**, 15, 641] that has over 200 citations. Other key research areas have been silicon-backbone polymers (polysilanes), high-temperature and high-strength polymers (e.g., PEEK and PPS), liquid-crystalline polymers, and epitaxial effects.

At NSF, Lovinger is in charge of the Polymers Program. His many contributions have been recognized with several NSF awards, including the 2006 NSF Director's Equal Opportunity Achievement Award, and other awards for Program Management Excellence (2000), for Superior Accomplishment (2003), for Collaborative Integration (2005 and 2009), and the Meritorious Service (2009). Lovinger has also been serving the ACS as Associate Editor of *Macromolecules* since 1988. He is also on the Editorial Advisory Boards of *J. Macromol. Sci. Phys.*, *J. Polym. Sci. Phys.*, and *Polymer*. He is very active in outreach activities and gives lectures about polymers to community groups, high schools, and middle schools.



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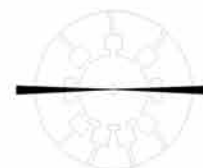
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Election Candidates for Councilor

MICHAEL JAFFE

Dr. Jaffe is a Research Professor of Biomedical Engineering and Chemistry at the New Jersey Institute of Technology and the Director of the Medical Device Concept Laboratory. Previously, he was a Research Fellow at the Hoechst Celanese Corporation, which he joined upon completion of his Ph.D. in Chemistry from Rensselaer Polytechnic Institute in 1967. His work has focused on understanding the structure-property relationships of polymers and related materials, the application of biological paradigms to materials design and the translation of new technology to commercial reality. He is a past chairman of the U.S. Policy Committee for IUPAC, a member of the ACS Committee on Science and an editor of the Journal of Engineered Fibers and Fabrics. He is a past member of the National Materials Advisory Board, is a past chairman of the Polymeric Materials: Science and Engineering Division of the American Chemical Society and has served on panels of the NSF, DOD, DOE, NASA and NIST. He has authored more than 75 technical publications, fifteen book chapters and 15 patents. He is a fellow of IUPAC, AAAS, PMSE and NATAS, a National Associate of the National Research Council and was the recipient of the 1995 Thomas Alva Edison Patent Award presented by the Research and Development Council of New Jersey.

FRANK JONES

Dr. Frank Jones recently retired as a professor at Eastern Michigan University (EMU). He remains active as a writer, researcher, and consultant. After 20 years in industrial research and R&D management, he joined academia. He was professor and department chair of Polymers and Coatings at North Dakota State University for seven years and Director of the National Science Foundation Industry/University Research Center in Coatings at EMU for 12 years. Dr. Jones is author or co-author of over 200 publications and 30 U.S. patents. His awards include the Roy W. Tess Award in Coatings (PMSE), a Distinguished Faculty Award (EMU) and the Joseph J. Matiello Memorial Lectureship (Federation of Societies for Coatings Technology). He is a PMSE Fellow.

In the 1990s, Dr. Jones served as Secretary, Vice-Chair, Chair Elect, Chair, and Past-Chair of PMSE. Currently, he serves as Alternate Councilor and represents PMSE on the Board of the Intersociety Polymer Education Council. His aims include promoting polymer and materials science education, supporting the evolution of PMSE programming to feature emerging trends in materials science and engineering, and encouraging the global involvement of PMSE.

~ Voting Instructions ~

If you are a member in good standing of the PMSE Division, look for your official ballot, blank ballot envelope, and pre-addressed return envelope attached inside this newsletter.

Seal your cast ballot inside the smaller blank envelope, then seal inside the pre-addressed return envelope, sign, and return to the PMSE secretary.

Important! For your vote to count, be sure to leave the blank ballot envelope unmarked, and don't forget to sign the outer return envelope.

Ballots must be received before Jan 29, 2010.

List of Candidates (*this is not the official ballot*)

Candidates for Councilor for 2010-2012 Term

(Vote for 1)

Michael Jaffe

Frank Jones

(The candidate receiving the most votes will become Councilor, the other will become Alternate Councilor)

Candidates for Member-at-Large

for 2010-2011 Term

(Vote for 6)

Kevin Cavvichi

John Gilmer

Rajeswari Kasi

Zhiqun Lin

Mahesh Mahanthappa

Anjali Patil

Javid Rzayev

Lisa Saunders-Baugh

Les Sperling

For questions about the election, please contact the 2010 PMSE Secretary: Dr. Jamil Baghdachi, (734) 487-3192, jamil.baghdachi@emich.edu

~ Don't forget to vote! ~

Election Candidates for Member-at-Large

KEVIN CAVICCHI

Kevin Cavicchi is an Assistant Professor in the Department of Polymer Engineering at The University of Akron. He received his B.S. in Materials Science and Engineering from Cornell University in 1998 and his Ph.D. in Materials Science and Engineering with Prof. Timothy Lodge at the University of Minnesota in 2003. He joined The University of Akron in the winter of 2006 after completing a post-doctoral fellowship at The University of Massachusetts-Amherst in the Department of Polymer Science and Engineering with Prof. Thomas Russell. In the summer of 2008 he was NASA-Glenn Summer Faculty Fellow where he investigated photo-responsive polymers. His research group focuses on the synthesis and assembly of organogelators and block copolymers for use in patterning surfaces, ion-exchange membranes, solar cells, and shape memory materials. He looks forward to this opportunity to serve the PMSE Division as a Member-at-Large.

JOHN GILMER

John Gilmer is presently employed as an Associate Professor of Chemistry at King College in Bristol, TN. His current research involves the chemistry of polymeric nanocomposite materials. He received his B.S. in Chemistry from the College of William and Mary and his Ph. D. in Physical Chemistry under Professor Richard Stein at the University of Massachusetts. From 1983 to 1985, he was a postdoctoral fellow with Professor Gerhard Zachmann at the University of Hamburg in Germany. Prior to joining King College in 2006, Dr. Gilmer worked as a Research Associate at Eastman Chemical Company in Kingsport, Tennessee in the development of high performance polyester resins. Previously he served as a Principal Scientist at EniChem Americas and as Assistant Professor of Polymer Science at Penn State University. His research interests include the engineering uses of polyesters, weathering and stabilization of polymers, the phase behavior of copolymers and blends, reactive extrusion, and polymer morphology. Dr. Gilmer has more than 40 patents and publications. For the past 15 years, Dr. Gilmer has been active in the PMSE Division as Editor of the PMSE News and as Publicity Coordinator. Presently, he serves on the chair of the committee for the AkzoNobel Award for Outstanding Graduate Research and chair of Polymer Educational Funding.

RAJESWARI M KASI

Rajeswari M. Kasi is an assistant professor at the University of Connecticut's Polymer Program and Chemistry Department, where her research focuses on stimuli-responsive polymers. She received her B.Sc. in Chemistry from University of Madras (1996), M.Sc. in Chemistry from Indian Institute of Technology, Madras (1998) and her Ph.D from the Polymer Science and Engineering Department under Professor Bryan Coughlin at the University of Massachusetts, Amherst (2004). From 2004 to 2006, she was a postdoctoral fellow with Professor Marc Hillmyer at the University of Minnesota. She has been with the University of Connecticut since 2006.

Dr. Kasi has been a member of ACS since 2002. She currently

serves as the chair of PMSE's Ford Travel Grant committee. She looks forward to serving a more active role in PMSE as a Member-at-Large. She is especially interested in helping PMSE continue its tradition of strong technical presentation by increasing the participation of graduate students both as presenters and symposium organizers.

ZHIQUN LIN

Zhiqun Lin is currently an Assistant Professor of Materials Science and Engineering at Iowa State University. He received an MS degree in Macromolecular Physics and Chemistry from Fudan University in Shanghai, China. He completed his PhD in Polymer Science and Engineering in 2002 from the University of Massachusetts at Amherst with Professor Tom Russell. In 2002, he received the Frank J. Padden, Jr. Award from APS for "Excellence in Polymer Physics Research". From 2002 to 2004, he was a postdoctoral fellow with Professor Steve Granick at the University of Illinois, Urbana-Champaign. He joined Iowa State University in 2004.

Dr. Lin's current research activities include semiconducting nanocrystals tailored with conjugated polymers and their use in solar cells, multifunctional nanocomposites with long-range hierarchical order based on block copolymers embedded with ferroelectric/superparamagnetic nanoparticles, phase behavior and phase separation kinetics of polymer dispersed liquid crystal in nanoscopic geometries, rational design and materials engineering of novel dye-sensitized TiO₂ nanotube solar cells, and formation of hierarchically ordered structures enabled by controlled evaporation of microfluids. He received the NSF CAREER Award in 2009. He has authored or co-authored over 60 peer-reviewed articles. Dr. Lin looks forward to serving as a Member-at-Large and having an active role in PMSE.

MAHESH K. MAHANTHAPPA

Mahesh Mahanthappa is currently a Professor of Chemistry at the University of Wisconsin-Madison. His research interests lie in the development of new synthetic methods in polymer chemistry and the physical characterization of the resulting polymeric materials in an effort to facilitate rapid identification of new functional materials targets, while enabling swift optimization of their flexible and scalable synthesis. Dr. Mahanthappa's group is currently focused on the synthesis of new biodegradable polymers, and amphiphiles derived from petrochemical feedstocks and understanding the effects of polydispersity on block copolymer phase behavior.

Dr. Mahanthappa received his B.A. in Chemistry and Mathematics at the University of Colorado-Boulder in 1997. As a Fannie and John Hertz Foundation Fellow at Stanford University, he completed his Ph.D. in Chemistry in 2003 under the supervision of Prof. Robert M. Waymouth in mechanistic studies of transition metal-mediated olefin polymerizations. Dr. Mahanthappa's interests in polymer physics resulted from his experiences as a postdoctoral research associate with Profs. Frank S. Bates and Marc A. Hillmyer at the University of Minnesota Department of Chemical Engineering and Materials Science and Department of Chemistry.

Election Candidates for Member-at-Large, Continued

Dr. Mahanthappa has strong interests in maintaining PMSE's strong and diverse national programs that help to define the emerging frontiers in polymer science, while also working on education and science literacy projects related to the implications of polymer science for the public at large.

ANJALI PATIL

Anjali Patil is Manager, Emerging Technology Group at Revlon Inc. She has been working at Revlon for the last 17 years. Her work involves synthesis and use of polymers in various aspects of cosmetic products. Dr. Patil obtained her Ph. D. from the Indian Institute of Technology, Bombay (India) in polymer chemistry and did her post-doctoral research at the University of Illinois at Urbana-Champaign in Organic Chemistry (Dr. David Y. Curtin) and also at the Institute for Polymers and Organic Solids, University of California, Santa Barbara (Dr. Fred Wudl).

Dr. Patil has been a member of ACS for the past 19 years. She has attended and chaired sessions at the National ACS meetings. She is a member of Society of Cosmetic Chemists. She has published 9 scientific papers, issued 14 US patents and published 27 more US patent applications. She has recently written a monograph on "Nail Lacquer Technology" that is published by the Society of Cosmetic Chemists. Her research interests are in synthesis and application of polymers.

JAVID RZAYEV

Javid Rzaev is an Assistant Professor in the Department of Chemistry at the University at Buffalo. He received his B.S. (1998) in Chemistry from the Middle East Technical University in Turkey and his Ph.D. (2003) in Polymer Science & Engineering from the University of Massachusetts Amherst. He then completed two and a half years of postdoctoral studies at the University of Minnesota working on developing nanoporous polymer membranes with tailored surface properties. Dr. Rzaev's research interests include synthesis of unique nanomaterials from bottlebrush copolymers, developing new polymerization methodologies, and understanding phase behavior of block copolymers with unconventional architectures. He recently received an NSF Career Award (2009). Dr. Rzaev is interested in strengthening PMSE Division's technical programming and expanding its international ties.

LISA S. BAUGH

Lisa S. Baugh is a Research Associate at ExxonMobil's Corporate Strategic Research Laboratory in Annandale, NJ. Her research spans numerous topics in polymer synthesis, structure, reactivity, and formulation, particularly transition metal-mediated polymerization and the preparation of functional and model polyolefins. She received her Ph.D. (1996) from the University of California, Berkeley, completing part of her thesis work in the Polymer Science & Engineering Department of the University of Massachusetts, Amherst. She has authored numerous technical publications and patents, including the recent edited book *Stereoselective Polymerization with Single-Site Catalysts*, and was a 2009 recipient of the

Central New Jersey YWCA TWIN (Tribute to Women and Industry) Award.

Dr. Baugh has also served in other areas of ACS, including CATL (2001 Secretary-General), Women Chemists Committee (Associate), and Chemistry magazine (Editorial Advisory Board). She is a member of the National Association of Science Writers, having contributed many feature pieces to college and high school chemistry textbooks. Outside of work, she is Principal Viola in the Hunterdon Symphony, and has traveled with the orchestra in recent years to perform in Russia and Austria.

Dr. Baugh has served ACS and PMSE in a number of positions with past roles as Member-at-Large, Membership Chair, Awards Publicity Coordinator, Books Committee Chair, PMSE Preprints Subscription Manager, and Electronic Preprints Committee member. She is currently the PMSE News Books review editor, works with technical publishers to obtain benefits for PMSE members, and handles many issues associated with institutional ordering of PMSE Preprints and the PMSE Preprints web page. She would like to continue this and other work for PMSE as a returning Member-at-Large.

LES SPERLING

Dr. L. H. Sperling, Ph.D. from Princeton in 1959, spent five years working for Buckeye Cellulose Corp. (part of Proctor and Gamble) working on cellulose problems. Then, he had a two year post-doc in Princeton. From 1967 until he retired in 2001, Dr. Sperling was a professor at Lehigh University, with a joint appointment in Chemical Engineering and in Materials Science and Engineering. Besides teaching polymer courses, he served as Education Chairman of the Center for Polymer Science and Engineering from 1987 until retirement. He is now Prof. Emeritus there.

His research centered on interpenetrating polymer networks and related materials and renewable resources. He has some 180 publications, and has written or edited 15 books in the area of polymer science and engineering, several resulting from chairing or co-chairing symposia at PMSE. Currently, he is Chairman of the committee to provide lists of new edited PMSE and POLY books to all on the POLY e-mail list. He is also a member of the Polymer Education Committee of the ACS, and has given several presentations to faculty at ACS meetings, providing an introduction to physical polymer science. If re-elected, Sperling intends to continue these activities, providing polymer education and polymer books and educational lectures.

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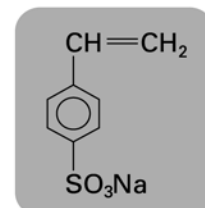
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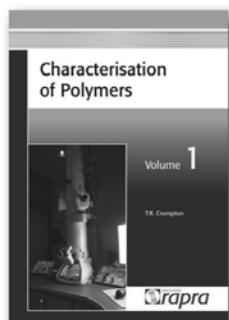
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2008 Doolittle Award Winners

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. A prize in the amount of \$1,000 is financed with the gift of royalties from A. K. Doolittle's book, *Technology of Solvents and Plasticizers*. All papers appearing in the Preprint Book are evaluated on the basis of content, with emphasis on originality and development of new concepts, and on the quality of presentation. Recipients are selected by an anonymous panel of judges appointed by the Chairman of the Doolittle Award Committee. The winners of the 2008 Doolittle Awards are as follows:

L. Hutchings, A. P. Narrainen, N. Clarke, R. L. Thompson and I. A. Ansari (Durham University, UK), "Modifying and repairing polymer surfaces with well defined multi end-functionalized polymers."



2008 Doolittle award winners from Durham University, UK.

L to R: Imtiyaz Ansari, Nigel Clarke, Lian Hutchings, Amilcar Pillay Narrainen, Richard Thompson

And

J. Long, A. Fischer, T. McEvoy, M. Bourg, J. Lytle and D. Rolison (Naval Research Laboratory), "Self-limiting electro polymerization en route to ultrathin conformal polymer coatings for energy storage applications."



2008 Doolittle award winners from Naval Research Laboratory.

Top Row, L to R: Megan E. Bourg, Anne E. Fischer, Jeffrey W. Long.

Bottom Row, L to R: Justin C. Lytle, Todd M. McEvoy, Debra R. Rolison



The advertisement features a large Waters HPLC system with a computer monitor and keyboard in the foreground. The background is dark with a pixelated, wave-like pattern at the bottom. The text 'POLYMER ANALYSIS SOLUTIONS' is enclosed in large square brackets. Below this, the text 'Waters HPLC, GPC, GC/MS, and LC/MS Systems' is displayed. The Waters logo and tagline 'THE SCIENCE OF WHAT'S POSSIBLE.™' are in the bottom right corner. A URL 'Visit www.waters.com/products for more information' is in the bottom left corner.

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