

PMSE NEWS

Polymeric Materials: Science and Engineering Division of the American Chemical Society
SPRING 2009

Message from our chair, Bryan Coughlin



Dear PMSE Members,

I am pleased to have the honor to serve as Chair of the PMSE Division in 2009. I am looking forward to continuing the tradition of leadership excellence that has been set by my predecessors, Dean Webster, Elliot Douglas, Ron DeMartino, Benny Freeman and the long list of distinguished previous Chairs of PMSE whose service is greatly appreciated by all Division members. We have a long and proud tradition as one of the oldest, and dare I say strongest, Divisions in the ACS. We have over 80 years of tradition behind us and the future looks bright and promising as we move forward even in these challenging economic times. The PMSE Strategic plan that was implemented in 2007 continues to be developed, with our stated goals being:

Goal #1: Transform program content to capture emerging trends in materials science and engineering for the global chemistry community.

Goal #2: Create the premier interactive web portal in materials science and engineering for the global chemistry community.

Goal #3: Strengthen the chemistry community in materials science and engineering by fostering interactions and creating an enhanced global presence.

Our vision statement: Reaching out across technical, generational, and international boundaries to create the premier home of materials science and engineering for the global chemistry community.

The United Nations General Assembly has designated 2011 as the "International Year of Chemistry" This global event will highlight the positive influences chemistry has had on society and commemorate the centennial of the awarding of the Nobel Prize in Chemistry to Marie Curie. The International Union of Pure and Applied Chemistry (IUPAC) has been awarded funding from the National Science Foundation (NSF) to coordinate a working discussion between the Presidents of IUPAC's sub-disciplinary Divisions and Committees, and the Chairs of the equivalent ACS Technical Divisions. These discussions, scheduled to take place during the August, 2009 ACS National Meeting in Washington, DC, will serve to highlight the work being done within these groups, to promote ties between scientists within the US and international chemistry communities, and to encourage the exploration of future collaborative projects. The event is being organized by the ACS International Activities Committee (IAC) and the ACS Office of International Activities (OIA) in collaboration with the Board on International Scientific Organizations (BISO) of the National Academy of Sciences (NAS), which manages the US membership in IUPAC. This International Year of Chemistry will provide the Division and all of its members with many wonderful opportunities to connect to with the broader international polymer community.

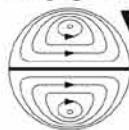
The ninth distinguished set of scientists are being added to the Pantheon of Polymeric Materials. This year's class of PMSE Fellows are well known to the Division for their impressive research accomplishment and great service to our Division, the national, and international polymer community. The inductees are Christopher K. Ober, Craig J. Hawker, Garth Wilkes, Lon J. Mathais and Alex Jen. Congratulations to them all for this much deserved honor.

The ACS Fellows Program was created by the ACS Board of Directors in December 2008 "to recognize members of the American Chemical Society for outstanding achievements in and contributions to Science, the Profession, and the Society."



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ACS 2009 Fall National Meeting Program

Washington, D.C. August 16-20, 2009

PMSE Events at the Grand Hyatt

Actuator and Simuli-Responsive Polymeric Materials and Composites.

Shaoqing Gong, Dept. of Mechanical Engineering, University of Wisconsin - Milwaukee, Milwaukee, WI 53201, 414-229-5946, sgong_at_uwm.edu; Ji Su, NASA Langley Research Center, 6 West Taylor Road, Hampton, VA 23681, 757-864-8336, ji-su-1_at_nasa.gov.

Akzo Nobel Student Award in Applied Polymer Science Symposium. John Gilmer, King College, 1350 King College Road, Bristol, TN 37620, 423-652-4808, jwgilmer_at_king.edu.

Biomaterials and Bioengineering. Ankur S Kulshrestha, BD Medical Surgical Division, G318a, Becton Building, 1 Becton Drive, Franklin Lakes, New Jersey 07417, 201-847-4538, Fax:201-847-4869, Ankur_Kulshrestha_at_bd.com; Anil Mahapatro, Center for Biotechnology and Biomedical Sciences & Dept. of Chemistry, Norfolk State University, 700 Park Avenue, Norfolk, VA 23504 USA, 757-823-8494, amahapatro_at_nsu.edu.

Efficiency, Lifetime and Reliability Issues in Organic Semiconductor and Photovoltaic Devices. Dean Delongchamg, National Institute of Standards and Technology, Polymers Division, Gaithersburg, MD 20899-8541, 301-975-5599, deand_at_nist.gov; Regis Joe Kline, National Institute of Standards and Technology, Polymers Division, Gaithersburg, MD 20899-8541, 301-975-4356, joe.kline_at_nist.gov.

General Papers/New Concepts in Polymeric Materials.

Todd Emrick, University of Massachusetts, Dept. of Polymer Science & Engineering, 120 Governors Drive, Amherst, MA 01003, 413-577-1613, tsemrick_at_mail.pse.umass.edu.

Hybrid Smart Micro- and Nanoparticles. Andriy Voronov, North Dakota State University, NDSU Dept. 2760, P.O. Box 6050, Fargo, ND 58108-6050; 701-231-9563, andriy.voronov_at_ndsu.edu; Alexander Sidorenko, University of the Sciences in Philadelphia, Dept. of Chemistry and Biochemistry, 600 South 43rd Street, Philadelphia, PA 19104, 215-596-8836, a.sidorenko_at_usp.edu; Sergiy Minko, Clarkson University, Dept. of Chemistry and

Bimolecular Science, 8 Clarkson Avenue, Potsdam, NY 13676, 315-268-3807, sminko_at_clarkson.edu; Igor Luzinov, Clemson University, School of Materials Science and Engineering, Clemson, SC 29634, 864-656-5958, luzinov_at_clemson.edu.

Hybrid Soft Materials of Natural and Synthetic Polymers.

Ting Xu, Dept. of Material Sciences and Engineering and Department of Chemistry, University of California - Berkeley, Berkeley, CA 94720-1760, 510-642-1632, tingxu_at_berkeley.edu; Daniel A. Savin, Dept. of Chemistry and Physics, University of Vermont, Cook Physical Science A116, 82 University Place, Burlington, VT 05405, 802-656-0276, Daniel.savin_at_uvm.edu.

Joint PMSE/POLY Poster Session. Todd Emrick, University of Massachusetts, Dept. of Polymer Science & Engineering, 120 Governors Drive, Amherst, MA 01003, 413-577-1613, tsemrick_at_mail.pse.umass.edu.

Porous Polymers. Michael Silverstein, Technion - Israel Institute of Technology, Haifa 32000, Israel, 972-4-829-4582, Michaels_at_tx.technion.ac.il; Neil R. Cameron, Dept. of Chemistry, Durham University, South Road, Durham DH1 3LE, UK, 44-191-334-2008, n.r.cameron_at_durham.ac.uk; Marc Hillmyer, Dept. of Chemistry, University of Minnesota, Minneapolis, MN 55455-0431, 612-625-7834, hillmyer_at_umn.edu; Neil McKeown, School of Chemistry, Cardiff University, Cardiff CF10 3AT, UK, 44-29-208-75851, McKeownNB_at_Cardiff.ac.uk.

Roy W. Tess Award Symposium in Honor of Christian Decker.

Christopher Bowman, University of Colorado, Dept. of Chemical Engineering, Boulder, CO 80309, 303-492-3247, christopher.bowman_at_colorado.edu.

Small Angle Neutron Scattering from Polymers and Complex Fluids.

Boualem Hammouda, National Institute of Standards and Technology, Building 235, Room 151, 100 Bureau Drive, Stop 6102, Gaithersburg, MD 20899-6102, 301-975-3961, hammouda_at_nist.gov.

Program Committee

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Applied Polymer Science Award in Honor of Benny D. Freeman



Benny D. Freeman, winner of the 2009 American Chemical Society Award in Applied Polymer Science, is cited for his "pioneering polymer science research that has defined the state of the art in polymer-based gas, liquid, and vapor separation membranes."

Benny is the Kenneth A. Kobe and Paul D. and Betty Robertson Meek & American Petrofina Centennial Professor of Chemical Engineering at the University of Texas at Austin. He received a B.S. from North Carolina State University in 1983 and a Ph.D. from the University of California, Berkeley in 1988, all in chemical engineering. He was a NATO Postdoctoral Fellow during 1988-89 at the Ecole Supérieure de Physique et Chimie Industrielles de la Ville de Paris (ESPCI) in the laboratories of Professor Lucien Monnerie and Liliane Bokobza. He served on the chemical engineering faculty of North Carolina State University during 1989-2002. He joined the faculty at the University of Texas at Austin in 2002. Benny supervises the research of a large group of graduate students in the area of membranes for separations. Over the past 40 years, gas separation properties of thousands of polymers have been measured. Empirically, a tradeoff is observed between gas permeability and gas selectivity. This behavior was widely recognized, but not well understood. Benny developed a model using fundamental facts that predicts this tradeoff behavior [Macromolecules, 32, 375 (1999)]. This publication helped change the

direction of research away from Edisonian structure/property studies seeking higher permeability and higher selectivity and towards issues such as membranes with improved chemical stability and membranes based on materials other than polymers. His group, in collaboration with Dr. Ingo Pinnau at Membrane Technology and Research, Inc., pioneered dispersion of nonporous inorganic nanoparticles in rigid polymers to produce nanocomposites that are, counterintuitively, more permeable and more selective than the native polymer. Their landmark work [Science, 296, 519 (2002)] expanded the portfolio of strategies to rationally manipulate permeation properties.

Removal of organic vapors from mixtures with air or nitrogen and removal of higher hydrocarbons from natural gas requires membranes that selectively remove larger molecules from mixtures with smaller molecules (so-called reverse-selective membranes). Working with Ingo Pinnau and Prof. Toshio Masuda of Kyoto University catalyzed the preparation of libraries of new reverse-selective materials. These materials harness higher solubility of larger molecules to promote high permeability of larger, more soluble components (e.g., n-butane) in mixtures with light gases (e.g., CH_4), a concept not previously appreciated. A review article co-authored by Benny [Prog. Polym. Sci., 26, 721-798 (2001)] summarizes the literature in this area.

In contrast to the traditional approach of using rigid, glassy polymers for gas separation materials, Benny's group has tuned the molecular structure of polar, rubbery polymers to remove CO_2 from gas mixtures. For CO_2/H_2 separations, these materials, based on poly(ethylene oxide) diacrylate, have among the highest combinations of CO_2 permeability and CO_2/H_2 selectivity ever reported, and their mixed gas selectivity improves as CO_2 partial pressure increases [Science, 311, 639 (2006)], which is opposite to conventional polymer membranes, where selectivity decreases, often catastrophically, at high CO_2 partial pressures. In natural gas separations, these membranes exhibit good CO_2/CH_4 selectivity at high CO_2 partial pressures and are an order of magnitude more permeable than conventional polymers [Adv. Mats., 18, 39 (2006)]. Membranes based on these materials are being deployed commercially for hydrogen purification.

While working on polymer materials design principles that challenge conventional wisdom, such as those described above, Benny and colleagues from Hanyang University in Seoul, Korea (Professors Young Moo Lee and Ho Bum Park) and CSIRO in Melbourne, Australia (Dr. Anita Hill) pushed the envelope on traditional, highly size selective materials by using biomimetic principles to design gas separation membranes having very high CO_2 permeability (1610 Barrer) and high CO_2/CH_4 selectivity (40) under strongly plasticizing conditions [Science, 318, 254 (2007)] to achieve what has been called a "breakthrough in the development of polymers for gas separation."

In liquid separations, Benny has challenged conventional notions regarding wastewater purification membrane design. Such membranes are typically porous and the major factor limiting their service life is pore blockage by contaminants, which leads to irreversible loss in membrane flux (membrane fouling). Ingo Pinnau and Benny used thin (< 1 micrometer), nonporous membranes of self-assembled block copolymers to provide continuous hydrophilic channels for water permeation through a mechanically stable, high strength matrix. These membranes have very high water flux but block contaminant transport, reducing membrane fouling by more than 90% for oily wastewater purification, which effectively increases membrane throughput by more than 10x. These membranes are being installed aboard a Navy ship to purify oily wastewater.

A recent collaboration with Professor James McGrath at Virginia Tech has yielded new desalination membranes with previously unattainable property profiles. This research has identified sulfonated polysulfones having uniquely outstanding chlorine resistance and excellent desalination properties. Initial results have garnered worldwide attention [Science, 313, 1088 (2006)].

Benny has organized major ACS and AIChE symposia, chaired the PMSE Division of ACS, chaired the Gordon Research Conference on Membranes, co-chaired the annual meeting of the North American Membrane Society and the International Congress on Membranes, the largest membrane meeting in the world. His students have taken high-profile positions in the field, further extending his influence to the next generation of scientists.

Benny also received the 2008 Award for Excellence in Industrial Gases Technology from the American Institute for Chemical Engineers for his work on gas separations using membranes and a 2008 IBM Faculty Award, which is an internationally competitive award given to university faculty who have an outstanding reputation for contributions to their field. In 2002, he received the PMSE Cooperative Research Award. He has received numerous additional teaching and research awards. He is an Associate Editor of Industrial & Engineering Chemistry Research (published by ACS) and is a member of the Editorial Board of the Journal of Membrane Science.



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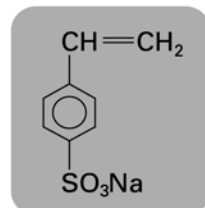
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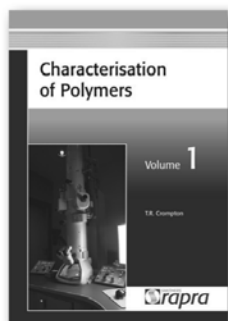
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Ninth Class of PMSE Fellows

The American Chemical Society Division of Polymeric Materials: Science and Engineering (PMSE) has completed its process to select a new class of Fellows for 2009, and the following people have been chosen:

Christopher K. Ober, Craig J. Hawker, Garth Wilkes, Lon J. Mathias, Alex Jen

They were inducted as the ninth class of PMSE Fellows at the Salt Lake ACS Meeting during the PMSE Awards Luncheon on Monday, March 23, 2009. PMSE is pleased to welcome this distinguished group of polymer scientists and engineers to the ranks of fellows. Here is a short description of each of their careers and accomplishments.



Prof. Christopher K. Ober

Professor Christopher K. Ober earned his B.Sc. from the University of Waterloo in Ontario, Canada, in 1978 and both his M.S. (polymer science and engineering, 1980) and Ph.D. (polymer science and engineering, 1982) from the University of Massachusetts at Amherst. After working at the Xerox Research Centre of Canada, Ober joined the Cornell faculty in 1986; he became associate professor in 1992 and a professor in 1998. He served as director of the Department of Materials Science and Engineering from 2000 to 2003 and as associate dean for research and graduate studies in the College of Engineering since 2007. In 2009, he will serve as interim Dean of Engineering at Cornell.

Ober's research focuses on polymers, lithographic materials for microelectronics and biotechnology, and new environmentally and biologically friendly materials. His professional honors include the 2006 American Chemical Society Award in Applied Polymer Science, a 2007 Humboldt Research Prize and a National Science Foundation Creativity Award this year. He is currently president of the International Union of Pure and Applied Chemistry's Polymer Division.

Professor Craig J. Hawker is currently Director of the Materials Research Laboratory and a Professor of Chemistry, Biochemistry and Materials at the University of California, Santa Barbara. From 1993-2004 he was a Research Staff Member and an investigator in the NSF Center for Polymer Interfaces and Macromolecular Assemblies at the IBM Almaden Research Center. He received a B.Sc. (Hons) degree and University Medal in Chemistry from the University of Queensland in 1984 and a Ph.D. in bioorganic chemistry from the University of Cambridge in 1988 under the supervision of Prof. Sir Alan Battersby. Jumping into the world of polymer chemistry, he undertook a post-doctoral fellowship with Prof. Jean Fréchet at Cornell University from 1988 to 1990 and then returned to the University of Queensland as a Queen Elizabeth II Fellow from 1991 to 1993. He has been honored by numerous awards including the 2005 ACS Award in Applied Polymer Science from the American Chemical Society, the 2005 Dutch Polymer Award, the 2007 Hermann Mark Scholar Award and the 2008 DSM Performance Materials Award. In addition to a variety of named lectureships, Dr. Hawker is Editor of the Journal of Polymer Science, Polymer Chemistry and an Adjunct Professor of Chemistry at the University of Queensland. His research has focused on the interface between organic and polymer chemistry with emphasis on the design, synthesis, and application of well-defined macromolecular structures in biotechnology, microelectronics and surface science.



Prof. Craig J. Hawker



Prof. Garth Wilkes

Professor Garth Wilkes is presently a University Distinguished Emeritus Professor of Chemical Engineering at Virginia Tech. He obtained his Ph.D. in Physical Chemistry in 1969 from the University of Massachusetts Amherst. He also obtained an M.S. degree in Polymer Science and Engineering from the same institution in 1967. Professor Wilkes holds B.S. and M.S. degrees (1964 & 1966) in Forestry from the New York State College of Forestry at Syracuse. He became an Assistant Professor of Chemical Engineering at Princeton University in 1969 and a tenured Associate Professor in 1976. In 1978 he joined Virginia Tech as a Full Professor in the Department of Chemical Engineering. Later he was promoted to a named chair professor and then to the title of University Distinguished Professor in 1999. He transferred to Emeritus status in 2003. During his career at Virginia Tech, he served as the co-director of the Polymer Materials & Interfaces Laboratory for over 25 years. He also was the director for six years of the interdisciplinary Ph.D. program on Materials Science and Engineering. His research is focused on the theme of the Structure-Property Behavior of Polymeric Materials. He has mentored over 60 Ph.D. candidates and several M.S. candidates as well. His list of publications numbers over 400 papers including book chapters and journal

papers. He has received many educational and research awards in his field including the ACS Rubber Division Chemistry of Thermoplastic Elastomers (TPE) Award, the Flory Award in Polymer Education, and the Creative Polymer Chemistry Award provided by the Polymer Division of the ACS. He is also very active as a consultant to the polymer industry and has taught over 200 polymer "short courses" to industrial polymer scientists and engineers.

Professor Lon J. Mathias has been teaching and doing research in polymer science for over 30 years. He received his Ph.D. and M.S. degrees from the University of Michigan in 1976 and 1974, respectively. He obtained his B.S. degree from the University of Iowa in 1971. He has developed new courses in polymer science and related areas that are taught on-campus at undergraduate and graduate levels and off-campus as short-courses. He has published over 300 papers, received over 20 patents and advised dozens of MS and PhD students toward successful careers. Education activities also include multimedia material (see the website at www.pslc.ws) and books aimed at all levels. Workshops for K-12 teachers and college faculty are offered annually along with a summer program for undergraduates and teachers and an annual conference for undergraduate researchers to present and interact (www.pslc.ws/inspire). Research areas range from traditional polymer synthesis and characterization to biomaterials and bio-based monomers and polymers (www.pslc.ws/mathias). He was director of the NSF-funded interdisciplinary graduate IGERT program providing students with education and training at the entrepreneurial interface between polymers and medicine (www.pslc.ws/igert).



Prof. Lon J. Mathias



Prof. Alex Jen

Professor Alex Jen has made pioneering contributions in the fields of molecular engineering of polymer photonics and electronics. He is currently the Boeing-Johnson Chair Professor and Department Chair of the Materials Science & Engineering, University of Washington. He has co-authored more than 400 papers and holds 50 patents and invention disclosures. He was selected as a Fellow by the American Association of the Advancement of Science (AAAS) in 2005, the International Society of Optical Engineering (SPIE) in 2006, and by the Optical Society America (OSA) in 2007.

PMSE is pleased to welcome Christopher K. Ober, Craig J. Hawker, Garth Wilkes, Lon J. Mathias, and Alex Jen to the ranks of fellows. The Division thanks everyone who has helped in this process by submitting nominations or participating in the selection.



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Chair's Message, Continued from front page

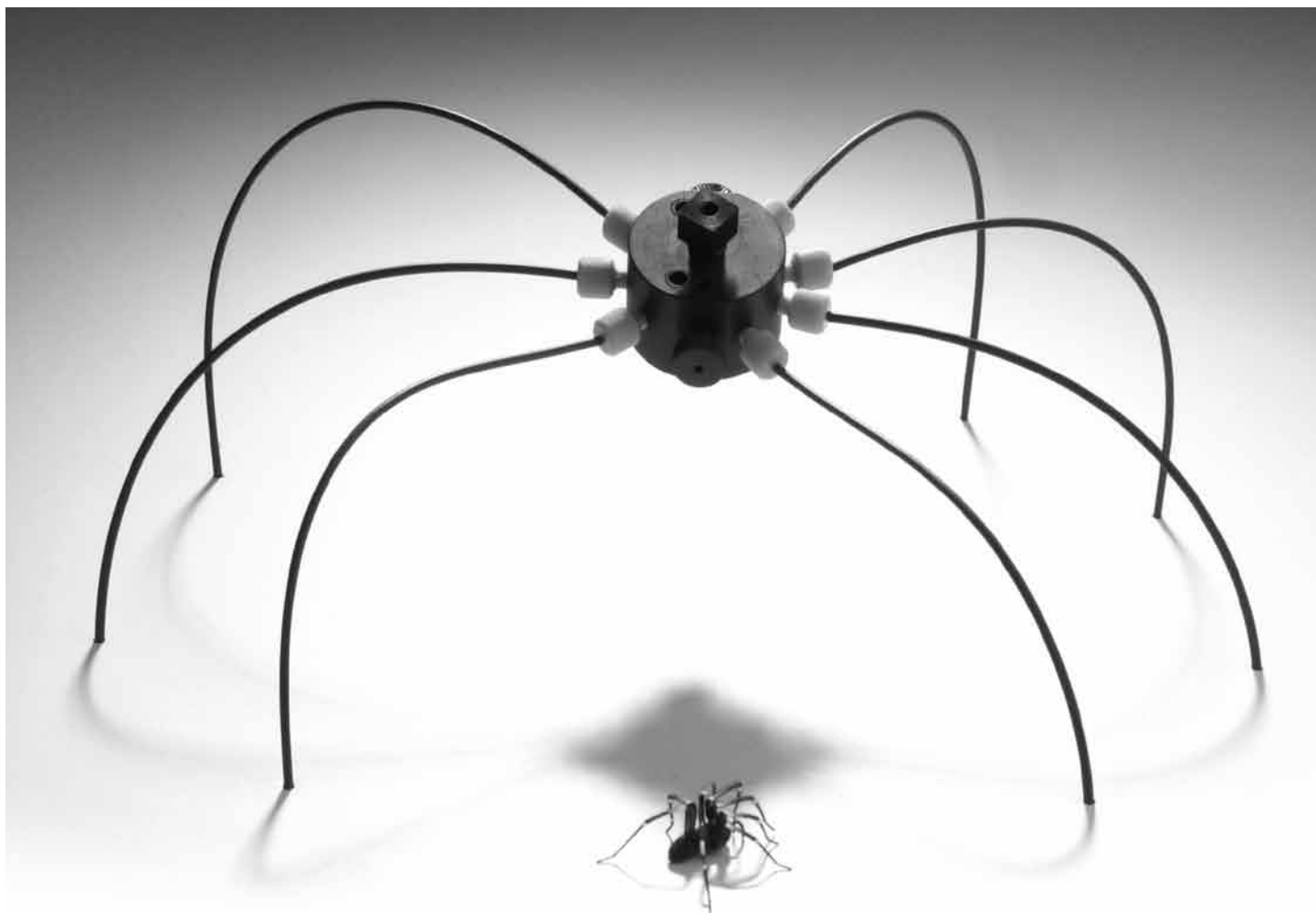
Unlike ACS national awards, the distinguished honor of a Fellows designation will go to those who have distinguished themselves in multiple areas, including promoting the science, the profession, **and** service to the American Chemical Society. Ultimately, the body of Fellows is intended to reach approximately 1–2% of ACS membership. More information about the ACS fellows program and the nomination forms can be found on the web.

I want to thank all of those members who stood for election to the many service positions within the Division. I congratulate the winners, Councilors: Dave Lohse and Ray Dickie; Alternates: Charles Carraher and Clara Craver; Members at Large: Zhenan Bao, Tim Bunning, LaShanda Korley, James Rawlins, Stuart Rowan, Debra Tindall.

The process is underway for a possible shift from distribution of the PMSE Preprints on CD to an online publication format via a web portal. Every transition of the PMSE Preprints, from the printed phone-book sized tome versions to the compact discs and now to virtual on-line publications has required some changes in habits of the membership. Each of these transitions has ultimately resulted in reduction of the cost of publishing for the Division and at the same time improved the availability and utility of the content. PMSE has a new arrangement with Curran Associates to fulfill institutional subscriptions and back issue orders of PMSE Preprints. Libraries and companies can now subscribe to, or purchase PMSE Preprints using Curran's web order form and a credit card. The new system has already increased PMSE's preprint subscription volume and royalty income. Also new on offer from Curran is a much-requested item: bound PAPER copies of all current and past PMSE Preprint CD volumes. Since ACS now sells web-based institutional PMSE Preprints subscriptions, libraries now have a full range of choices for their Preprints (web, print, or CD). The PMSE Preprints web page (<http://membership.acs.org/P/PMSE/preprints/>) features links to Curran's web sites and up-to-date information for all PMSE members, authors, and subscribers regarding Preprint inquiries and orders. (For fun, we've also added a neat Cover Gallery of past CD covers.) If your school or corporate library is not offering the type of Preprints access you would prefer, please inform them of these new options described on our web page.

With the troubling economic times facing all of us I want to write a special thanks and recognition of the PMSE finance committee - David Chung, John Lupiknsi, Ted Provder, Todd Emrick and our new treasurer David Martin. Their level-headed approach is keeping the Division on a sound footing.

If you are interested, I urge you to consider volunteering to assist the Division in any of the many activities that occur not just at the National Meetings but throughout the year. You can look at the Division's web-site, <http://membership.acs.org/P/PMSE/> or contact me at coughlin@mail.pse.umass.edu or (413) 577-1616 if you are interested in serving in some capacity.



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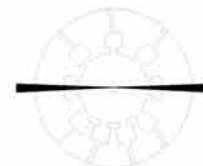
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2009 Roy W. Tess Award in Coatings



Dr. Christian Decker

Dr. **Christian Decker**, Director of Research at the National Center for Scientific Research (CNRS) in Strasbourg, France, will receive the **Roy W. Tess Award in Coatings for 2009**. The announcement was made by the Officers and the Award Committee of the Division of

Polymeric Materials: Science and Engineering (PMSE) of the American Chemical Society.

Dr. Decker is recognized as one of the world's leading experts in the area of radiation-induced reactions in polymeric materials. His main research interests are in ultrafast light-induced polymerizations, the synthesis and characterization of UV-cured coatings and nanocomposite materials, photostabilization of polymers, and laser-assisted chemical processing of polymers. He has contributed over 300 publications, patents and book chapters to the coatings and scientific literature as well as given more than 300 lectures at scientific meetings. Prof. Decker is a member of the American Chemical society, Radtech International, RadTech Europe, French Society of Polymers and the French Society of Chemistry.

Dr. Decker received his MS degree in Chemical Sciences from the University of Strasbourg in 1960, Engineer degree from Ecole Nationale Supérieure de Chimie de Strasbourg in 1961 and then became an attaché de recherche at the CNRS in 1962. He received the Doctorate degree in Physical Sciences from the University of Strasbourg in 1967. He has been working at the Research Center on Macromolecules of Strasbourg and at Stanford Research in California. In 1975 Professor Decker joined the University of Haute Alsace and became Head of the Polymer Photochemistry Laboratory at the Ecole Nationale Supérieure de Chimie de Mulhouse.

One of Dr. Decker's main research interests have included novel highly reactive acrylate monomers which contain cyclic carbamate or cyclic carbonate moiety and when used as reactive diluents in UV curable resins undergo polymerization 5 times as fast as conventional monoacrylates as well as improve the mechanical properties of the UV cured polymers. He also demonstrated that acrylic resins can be hardened quasi-instantly by simple exposure to an intense UV laser beam. This process has lead to a number of commercial industrial applications including the build up of complex 3-dimensional objects. He also has been involved with developing Real-Time Infrared Spectroscopy to follow in-situ ultrafast polymerizations induced by light or lasers. He also has been involved in photostabilization of polymers with UV-cured polyurethane-acrylate coatings to improve the outdoor durability of such polymer materials as PVC, polycarbonates, wood panels and painted metals. Dr. Decker also has used UV-curing of nanocomposite polymers with as little as 3wt% clay nanoparticles at ambient temperatures to improve barrier and mechanical properties which is of value in floor finishing and furniture applications. Most of the work carried out by Dr. Decker and his team has been in close collaboration with many industrial partners. Dr. Decker has received many awards for his research and development efforts from RadTech Europe and RadTech International.

Dr. Decker will receive the Roy W. Tess Award from Dr. E. Bryan Coughlin, Chair of the PMSE Division, on Monday, August 17, 2009 during the 238th National Meeting of the American Chemical Society in Washington, D.C. Dr. Decker will present an Award Address at that time. An evening reception sponsored by the PMSE Division will follow the Award Symposium.

The Tess Award is presented annually by the PMSE Division in recognition of outstanding contributions to coatings science and technology. It is funded by a grant to the Division from Dr. and Mrs. Roy W. Tess. The purpose of the award is to encourage interest and progress in coatings science technology and engineering and to recognize significant contributions to the field. The Award consists of a plaque and a \$3000 cash prize.

Distinguished Service Award



Dr. Murrae J. Bowden

The recipient of the 2009 Distinguished Service Award, given by the ACS Division of Polymeric Materials: Science and Engineering (PMSE) is Dr. Murrae J. Bowden. Dr. Bowden has been a member of the Polymeric Materials: Science and Engineering Division of the American Chemical Society for 37 years, over which time he has served the Division in a number of capacities. He organized several symposia for PMSE in the area of electronics and photonic applications of polymers. He served as Secretary 1980-1981, and then progressed through the offices to become Chair in 1984. From 1985 to 1995, he served as Chairman of the Sherwin-Williams Student Award Committee, organizing and chairing the annual Sherwin-Williams Award Symposium at the Fall ACS meeting.

Dr. Bowden received his B.S. degree (First Class Honors) in Chemistry in 1965 from the University of Queensland in Australia, and a Ph.D. degree in Physical Chemistry from the same institution in 1969. He then spent two years as a Post Doctoral Fellow at the University of Manchester, England, and in October 1971, joined AT&T Bell Laboratories in Murray Hill, New Jersey as a member of the technical research staff. At Bell Labs, he conducted research into the effects of high-energy radiation on polymeric materials, with particular application to the development of polymeric resists used in the lithographic fabrication of microelectronic circuits. As supervisor of the Radiation Sensitive Materials and Applications group, he was responsible for electron beam resist development in support of Bell Labs' commercial photomask-making tool technology. With the divestiture of AT&T in 1984, Dr. Bowden joined Bell Communications Research (Bellcore) as Division Manager of the Chemistry and Materials Science Research Division, and from 1990 - 1995 was Assistant Vice President of the Network Technologies Research Laboratory.

After a brief period as Bellcore Executive-in-Residence at Stevens Institute of Technology, he joined Arch Chemicals (formerly Olin Corporation) Microelectronics Materials (AMM) Division in Rhode Island in 1997 as Director of R&D where he was responsible for materials research and product development for the Photoresist, Photosensitive Polyimides, Formulated Products, and Thin Films product lines. Dr Bowden returned to Stevens in August 2003 where he is currently Director of the MBA/EMBA programs in the Howe School of Technology Management. He is also President of EMP Consulting which provides consulting services on materials and processes to the electronics materials industry.

Dr. Bowden is a co-inventor of Bell Labs' 1977 IR-100 Award-winning electron resist technology, and in 1988 was selected as an Outstanding American Inventor and Finalist in the Inventor of the Year Competition sponsored by the Intellectual Property Owners Association for his work on resist materials for production of advanced integrated circuits. He was the co-recipient of the 1992 Carothers Award of the Delaware Section of the American Chemical Society for his contributions to the field of resist materials for microlithography, and was named as one of the 1992 New Jersey Inventors of the Year for his contributions to science and industry. He has authored or co-authored over 100 technical publications in the areas of solid-state polymerization, rubber-toughened polymers and resist materials for microelectronics. He holds 7 patents and has jointly edited 3 books. He became a PMSE Fellow in 2000.

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