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Materials Engineering and Sciences Division Newsletter

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Notes from the Chair

Dear MESD Members and Friends,

Welcome to the division election edition of the MESD Newsletter! Inside you will find biographies and statements of excellent candidates for the various MESD positions, including Second Vice-Chair, Director and Secretary-Treasurer. The Second Vice-Chair will coordinate programming for the 2009 Fall Annual Meeting, and eventually progress to the position of Chair of the division. Our Directors do a tremendous job of promoting the Division to the rest of AIChE, the chemical engineering community, and prospective members. The Secretary-Treasurer keeps minutes of the Executive Committee meeting and oversees division finances. All of these roles are being summarized and revised by Alon McCormick (U. Minnesota) as he updates the Division by-laws. I hope to be able to bring you the important aspects of this document in the very near future.

These candidates will replace some fine individuals who have given much of their time and energy to the division. The outgoing Directors are Buddy Ratner (U. Washington) and Tom Keuche (U. Wisconsin). I have very much enjoyed my time as Chair, and turn the podium over to Paula Hammond (MIT) who I am sure will do an excellent job. The rising First Vice-Chair is Don Baird (Virginia Tech). Matt Stefanick (Caterpillar) will continue as Newsletter editor, Pete Ludovice (Georgia Tech) as Webmaster, and Eric Lin (NIST) and Joel Fried (U. Cincinnati) as Directors.

In closing, I would like to give special recognition to Prof. Stevin H. Gehrke (U. Kansas) for his service to the Division. Steve has served as Secretary-Treasurer since 1993, and as you can see from the list of previous position-holders, he is by far the longest serving secretary-treasurer the division has ever had. This is for good reason. Steve is a diligent note-taker at the Executive Committee meetings and produces some of the most thorough minutes I have ever seen. His knowledge of division finances is unrivaled, and he has always provided the chair with sage advice regarding the use of division funds. As Steve moves on to "bigger and better things," please join me in thanking him for his service to the division.

I look forward to seeing you all in Salt Lake City in November.

With Kindest Regards,

Brian S. Mitchell
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MESD Secretary-Treasurers

J.S. Kummins, Dow Corning (1969-74)
G.L. Costan, Dow Corning (1975-76)
P.V. Tebo, DuPont Co. (1977-78)
T.H. Forsyth, University of Akron (1979-82)
G.S. Huvard, B.F. Goodrich, (1983-92)
S.H. Gehrke, University of Cincinnati (1993-)

MESD to Program at Spring Meeting

MESD is co-sponsoring two sessions at the upcoming joint ACS/AIChE Spring Meeting to be held in New Orleans April 6-10, 2008:
http://aiche.confex.com/aiche/s08/jointcfp.htm
Sessions on "Directed Assemblies Using Surface Templates" with the ACS Division of Analytical Chemistry and "Entrepreneurship in Polymers for the Energy and the Environment" with the ACS Division of Polymer Chemistry will be co-chaired by MESD members Michael Hu and Brian Grady, respectively. The joint meeting between ACS and AIChE is a great opportunity for highlighting MESD activities and networking. Please plan to participate!

Candidates for Position of Second Vice Chair (vote for one):

(i) Balaji Narasimhan (ii) Ed Seebauer

Balaji Narasimhan is the Associate Dean for Research and Economic Development in the College of Engineering and a Professor of Chemical and Biological Engineering at Iowa State University (ISU). He has been at ISU since 2001 before which he was an Assistant Professor in the Department of Chemical and Biochemical Engineering at Rutgers University. In 2006, he was appointed as the Director of the Institute for Combinatorial Discovery, a cross-disciplinary research center consisting of more than 35 faculty members focused on combinatorial materials science research. He received his BS in Chemical Engineering from the Indian Institute of Technology, Bombay (India) and a Ph.D. from Purdue University. His postdoctoral research was carried out at MIT. He has won various awards including the Best Doctoral Dissertation in Mathematics, Physical Sciences, and Engineering at Purdue University, the Whitaker Foundation Biomedical Engineering Research Award, the 3M Non-Tenured Faculty Award, and the ISU Foundation Early Excellence in Research Award. In 2003, he was named as one of the world's top 100 young innovators by MIT's Technology Review Magazine with the TR-100 Award.

Balaji's research is focused on the molecular design of nanostructured polymer systems and biomaterials to precisely control molecular architecture and functionality in these systems. The overall goal is to answer critical questions related to organization and dynamics occurring on length scales ranging from the nanometer to the micron-scale at surfaces of and interfaces between polymers, inorganic materials (e.g., magnetite nanocrystals), cells, and biomolecules (e.g., proteins). His research directions can be classified into two broad themes: engineered biomaterials for drug, protein, and vaccine delivery; and nanostructured polymers. The tools utilized by his group include novel synthesis methodologies, state-of-the-art characterization of polymer nanostructure and dynamics, and molecular modeling. His current research thrusts are in the areas of engineered biomaterials for controlled delivery of polypeptides and vaccines, nanoscale manipulation of multiphase polymeric materials, bio-inspired materials, nanoparticles, and combinatorial materials science. His research has received funding from NSF, NIH, DOD, DOE, USDA, the Whitaker Foundation, the Roy J. Carver Foundation, the W.M. Keck Foundation, the Camille and Henry Dreyfus Foundation, and industry. Balaji has published over 65 articles and book chapters, three patents issued and pending, edited three textbooks, and has given over 35 invited national and international lectures.

Balaji has been actively involved in programming for several professional organizations including AIChE, APS, MRS, and BMES. He has been involved with AIChE since 1997 and is the current chair of Area 8A (Polymers) within MESD. He has chaired sessions in the areas of diffusion in polymers, polymer thin films, and structure-property relationships. He has organized symposia for the Materials Research Society (2000) and the Biomedical Engineering Society (2002). Some of his recent AIChE-related activities include co-organization of the joint US-Japan topical conference on Medical Engineering, Drug Delivery Systems, and Therapeutic Systems and coordination of topical symposia in the areas of organic electronics and fuel cells.

As Second Vice-Chair, Balaji will work hard to maintain the high profile and activity level of the MESD and exploit the inherent connectivities between materials, biology, and nanotechnology. He will expand MESD programming via topical conferences and joint programming with materials-related divisions of other societies (e.g., PMSE-ACS, DPOLY-APS). He will also strive to enhance industrial involvement in MESD.

Edmund G. Seebauer is the James W. Westwater Professor and Head of Chemical & Biomolecular Engineering at the University of Illinois at Urbana-Champaign. He received his BS at Illinois in 1983 and PhD at Minnesota in 1986. He spent a year of postdoctoral work at Sandia National Laboratories before returning to Illinois in 1988 as a faculty member. His awards include an NSF Presidential Young Investigator Award, an A. P. Sloan Research Fellowship (Chemistry), a DuPont Young Faculty Award, and an Inventor Recognition Award from Semiconductor Research Corporation. He is a Fellow of AVS and has served as an IEEE Electron Device Society Distinguished Lecturer. He has several awards for teaching and student advising. Ed has held leadership roles in several professional societies. Within AIChE, he was program chair for the Electronic and Photonic Materials Area (8E) within MESD from 2001-03, and during that time regularized and greatly diversified that Area's programming. He served as program chair for the Manufacturing Science & Technology Group at AVS in 2002, and currently holds the positions of Treasurer (since 2000) and Co-Chair (since 2002) of that unit. He is currently a co-organizer for the 17th International Conference on Ion Implantation Technology in 2008, and sits on the International Committee of that independent conference organization.

Ed's research focuses primarily on semiconductor defect engineering. He has discovered a suite of physical mechanisms for controlling the behavior of point defects in semiconductors with surfaces, light, and ions. These methods are finding direct use to solve practical problems in transistor manufacture for integrated circuits and the development of catalyst supports with novel properties. He has nearly research 140 publications including several book chapters. He has also co-authored a textbook on engineering ethics, and is currently

writing a book on defects in semiconductors.

Materials lie at the heart of the chemical engineering discipline. A substantial challenge for MESD in the coming years will be to maintain its core identity while adjusting its focus to incorporate major new societal issues such as affordable and sustainable energy use. The steadily proliferating number of forums within AIChE can be a useful means to move in new research directions, but only if the primary specialties maintain their strength and sharp focus. I have seen such issues play out in most of the programming positions I have held over the years, and have learned that within a disciplinary society such as AIChE, strong connections to industry and provision for a few focused sessions in student education can greatly strengthen and sustain first-class technical programming. My research and programming work has had a strong industry component, which has given me an extensive network of industry contacts that should be useful for MESD. As chair of Area 8E, I instituted the regularized incorporation of occasional but very coherent sessions in electronic materials education. If the membership of MESD agrees that such sessions are worthwhile, I will advocate for a similar approach at the division level.

Candidates for Position of Treasurer (vote for one):

(i) Douglass Kalika

Douglass Kalika is currently Professor of Chemical Engineering in the Department of Chemical & Materials Engineering at the University of Kentucky in Lexington. Doug holds degrees from M.I.T. and the University of California at Berkeley, and joined the faculty at Kentucky in 1990. His research has been focused on the investigation of structure and dynamics in crystallizable polymers and blends, composites and polymeric membranes. During the period 1998-2003, Doug served as Senior Associate Dean and Acting Dean of the University of Kentucky Graduate School.

Doug has been active in MESD and AIChE programming over the last 15 years, having served as Chair of the Materials Poster Session (1993-1996), Vice-Chair and Chair of the Polymers Division (1997-2001), MESD Webmaster (1997-2001), and MESD Director (1999-2001). In addition, Doug served as Vice-Chair and Chair of the Division from 2001 to 2004. Doug would like to recognize Steve Gehrke's outstanding long-term service to the Division as Secretary/Treasurer, and would consider it a privilege to succeed him in this role.

Candidates for Position of Director (vote for two):

(i) Sharon Glotzer (ii) Alon McCormick (iii) Talid Sinno

Sharon Glotzer received her B.S. in physics from UCLA in 1987 and her Ph.D. in physics from Boston University in 1993. Under an NRC Postdoctoral Fellowship and then as a member of the technical staff, she worked at NIST as a physicist in the Polymers Division of the Materials Science and Engineering Laboratory, and co-founded and directed the Center for Theoretical and Computational Materials Science. She moved to the University of Michigan in 2001, where she is now Professor of Chemical Engineering, Materials Science and Engineering, and Physics.

She also holds the titles of Professor of Applied Physics and Professor of Macromolecular Science and Engineering, and is a faculty affiliate in the University of Michigan's Center for Theoretical Physics, Center for the Study of Complex Systems, Center for Computational Medicine and Biology, the UM branch of the Institute for Complex Adaptive matter (on which she serves on the steering committee) and the Michigan Nanotechnology Institute for Medicine and Biological Sciences (on which she serves on the executive board). Sharon is a computational scientist specializing in soft matter and nanomaterials theory, with a special focus on self-assembly and phase transformations in liquids, glasses and jammed materials, nanoparticles and colloids, liquid crystals, polymers and other complex fluids. She uses simulation to design new materials by exploiting anisotropy in colloidal particles to assemble them into complex structures with unique properties. She also studies virus assembly and other biological phenomena as models for mimicry by non-biological materials. Sharon received the American Physical Society's Maria Goeppert-Mayer Award, Presidential Early Career Award for Scientists and Engineers (PECASE), and Department of Commerce Bronze Medal, and was a Sigma Xi Lecturer. Her efforts in research, teaching, and service have been recognized by the University of Michigan's Rackham Faculty Recognition Award, College of Engineering's Monroe-Brown Foundation Research Excellence Award, and Department of Chemical Engineering's Departmental Excellence Award. Sharon has served as chair of the American Physical Society's Forum on Industrial and Applied Physics and chair of AIChE's Nanoscale Science and Engineering Forum (Group 22). She also recently completed two consecutive three-year-terms on the executive committee of Area 1A. She was a member of the National Academies' Solid State Sciences Committee, serves on the TIGER Committee on Defense Intelligence, and was a member of the NRC Technology Warning study committee and Biomolecular Materials and Processes study committee. She has served on the editorial boards of Computers in Science and Engineering,

Nanotechnology, PhysChemComm, AIChE Journal, and Oxford University Press Topics in Chemical Engineering, and is a fellow of the American Physical Society.

As Director, Sharon is eager to draw on her experiences with NSEF, Area 1A, and the Computational Molecular Science and Engineering Forum (CoMSEF) to create new initiatives, fundraising, and programming opportunities for MESD. The materials discipline continues to diversify, creating new opportunities for chemical engineers working at the boundaries between materials, biology, nanotechnology, simulation, and other areas. Materials science and engineering concepts underlie much of chemical engineering, driving scientific and technological advances in application areas ranging from alternative energy solutions to drug delivery where the design of innovative new materials is key.

As such, the MESD has a critical, leading role to play in defining the materials agenda within AIChE in collaboration with partner divisions. As Director, Sharon is eager to initiate discussion and action to further strengthen MESD's cross-disciplinary activities and its role within the Institute.

Alon McCormick B. S. ChE Tulane University 1983 Ph. D. University of California, Berkeley 1987 (ChE, advised by Bell and Radke) Postdoc, UC Berkeley (Chemistry, advised by Pines)

For 18 years now Alon has been in the Chemical Engineering and Materials Science department (a great combination!) at the University of Minnesota. Alon has taught, advised research, participated in department administration, and consulted and collaborated with industry in fields represented mostly in 8A (Polymers) and 8D (Ceramics), but has also had occasional activity touching on Biomaterials, Electronic / Photonic Materials, Composites (particularly Nanocomposites - cf. NSEF division), and also in Particle Technology (cf. Group 3 - Particle Technology Forum). At Minnesota Alon is the program leader of the Nanostructural Materials and Processes research program (with Davis, Tsapatsis, Frisbie, Norris, and others) , and has also been active in the Coating Process Fundamentals program (with Scriven, Francis and others), both parts of the Industrial Partnership for Interfacial and Materials Engineering (IPrime). These experiences have grown a concern for academic/industrial partnership and for training our postdocs, grad students, and undergrads for careers in developing technology fields. Alon has published about 150 papers, many coauthored with materials and chemical engineering colleagues in university and industry.

Alon's research directions have been in hybrid inorganic/organic polymerization (often called "sol/gel" processes), radiation-induced crosslinking polymerization to glassy coatings, and molecular self-assembly processes using surfactant systems. Alon has also served on the MESD Executive Board and other AIChE roles, and has recently started ABET service.

Alon's goals as an MESD Director would be: a) to foster academic / industrial interaction in our division, with particular emphasis on the benefits of these interactions to postdocs and students who, of course, shape the future of AIChE, b) to foster effective collaboration with the growing number of other AIChE divisions and forums, since many, if not all, of the AIChE divisions have profound bearing on and needs of the materials community (materials in chemical engineering should be viewed as a core division with many radiating spokes connecting with other groups, both older and newer), and c) to encourage entry into MESD activities by young professionals (both academic and industrial) with outreach to current students.

Talid Sinno received his B.S. in Chemical Engineering and B.A. in Chemistry from the University of Pennsylvania. He received a Ph.D. (1998) in Chemical Engineering from M.I.T. after which he pursued postodoctoral work, also at M.I.T., until 1999. He has been a member of the faculty of the Department of Chemical and Biomolecular Engineering at Penn since 1999, and is currently Associate Professor and Director of Graduate Admissions. Talid's research interests are in the broad area of multiscale computational materials science with specific focus on nucleation and aggregation processes in crystalline electronic materials. More recently, he has also been involved in studies of crystallization in colloidal suspensions and stress-directed microstructural evolution in metallic alloys. Talid has received the NSF Career Award (2001) and was selected to attend the Sixth NAE Frontiers of Engineering Symposium meeting in 2000.

Talid has been active in AIChE programming over the last several years. He has chaired or co-chaired numerous sessions in multiple Areas and served as the Chair of Area 8e (Electronic Materials) in 2005. As a Director of MESD, he hopes to work on ways to better manage joint programming across the different sub-divisions of MESD. With the ever-increasing number of materials-related topics covered at AIChE meetings, more effort must be made to optimize programs in order to reduce overlap thereby increasing the impact of each session.

The polls for MESD elections will be open from: September 24th-October 19th

To vote for candidates use the following web site with the division pass code for login "MES":
http://www.aiche-xtranet.org/divisions/ballot/index.asp

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