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The Global Home of Chemical Engineers

MESD
Materials Engineering & Sciences Division
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# MESD Division Newsletter

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***Notes from the Chair***

Dear MESD Members and Friends,

It has been an eventful year for MESD with many changes and new initiatives. The success of MESD begins with you through the various routes of support: your volunteering, participation and continued membership! Typically, the newsletter begins with a congratulatory note to the winner of the Charles M. A. Stine award, but this year I wish to begin by thanking Prof. Doug Kalika, who has served officially as the Secretary-Treasurer of the division since Fall 2007 and unofficially in many other roles, including webmaster and advisor, for his tremendous and dutiful service. Doug has decided to step away from serving as the Secretary-Treasurer of MESD, but he has graciously agreed to assist in the transition over the next year to ensure that the division continues to run smoothly. Doug's service has been exemplary.

There were many excellent nominees for the Charles M. A. Stine award and Owens Corning Early Career award. I am happy to report that Prof. Karen K. Gleason from MIT will be receiving the Charles M. A. Stine award "for new chemical insights into the scientific understanding of vapor deposition of organic materials and their translation to pioneering technologies for polymer coating of surfaces," and Prof. Thomas H. Epps, III of the University of Delaware is the recipient of the Owens Corning Early Career award "for groundbreaking research in understanding and engineering block polymer interfacial energetic towards the nanoscale self-assembly of polymers in bulk, thin films, and solutions."

I am pleased to report that the area plenaries and graduate student awards at the 2014 Annual meeting in Atlanta, GA were well attended and considered successful. These sessions, in general, are continuing for the 2015 Annual meeting in Salt Lake City, UT. I am pleased to announce that the effort of Prof. Mike Kilbey, our 1st Vice Chair in charge of the program this year, has resulted in no programming on Friday! I would like to solicit feedback from the MESD community if a smaller program (hopefully resulting in higher quality programming) without Friday sessions remains the desired direction for MESD. Personally, the programming for 2015 appears very exciting and I need to thank Prof. Kilbey, the MESD Area Chairs and Co-Chairs, Session Chairs and Co-Chairs for all of their efforts. The number of MESD sessions for 2015 meets the AICHE allotment, so no additional decreases for 2016 are planned. We believe that the cuts to this point have ensured that we provide interesting, well-attended sessions, with cutting edge research papers.

Particular highlights for the MESD programming for 2015 include our division-wide poster session on Monday evening, the MESD plenary session on Wednesday morning (11/11/2015, 8:30-11am), organized in part to recognize the recipients of the Charles M. A. Stine and Owens Corning Early Career awards, plenary sessions in Polymers (Monday, 11/9/2015, 8:30-11am; 12:30-3pm) and Biomaterials (Monday, 11/9/2015, 12:30-3pm), and graduate student awards in Electronic and Photonic Materials (Monday, 11/9/2015, 8:30-11am) and in Polymers (Tuesday 11/8/2015, 8:30-11am). Highlights from last year's sessions are included later in the newsletter for those that were unable to attend. Additionally on the following pages you will find the bios and statements of the candidates for the positions of 2nd Vice Chair, Directors and Secretary/Treasurer. Please cast your vote. The election will be taking place from September 1st to 15th and you will receive an email with the web link. I look forward to seeing everyone in Salt Lake City.

Bryan Vogt
Professor
Department of Polymer Engineering
University of Akron

**2014 Graduate Student Awards in Area 8A: Polymers**

The 2014 AIChE Materials Engineering and Sciences Division Area 8A (Polymers) held its inaugural session for Excellence in Polymer Graduate Polymer Research at the 2014 AIChE Annual Meeting in Atlanta, Georgia. This honorary session consisted of talks by graduate students who have demonstrated excellent academic performance in chemical engineering research regarding any field regarding the area of polymer science and engineering. The session was sponsored by the *Journal of Applied Polymer Science* because of the journal's commitment to encouraging junior researchers to achieve high performance in the field. The speakers were nominated by their research advisors and selected by a committee to present at the 2014 AIChE Annual Meeting. All 10 finalists presented high-quality work, and the large audience was impressed with the results coming from the presenters. After careful deliberation, the committee selected the following graduate students as award winners. The first place winner, and the recipient of a $620 award from the *Journal of Applied Polymer Science*, was **Hyomin Lee** from the Massachusetts Institute of Technology (advised by Professor Robert Cohen) for his work on polymers for antifogging coatings. Second place was awarded to **Yoonseob Kim** from the University of Michigan (advised by Professor Nicholas Kotov), whose efforts focus on combining inorganic nanoparticles with polymeric materials in a layer-by-layer assembly process in order to create stretchable electronic devices. **Jeffry Ting** from the University of Minnesota (advised by Professors Theresa Reineke and Frank Bates) was awarded third place for his work on polymers for drug delivery. The organizers would like to thank all of the speakers and our financial sponsors for making this inaugural Excellence in Polymer Graduate Polymer Research session one to remember for many years to come. Congratulations are in order for all of the finalists.

**2014 Graduate Student Award Winners in Area 8B: Biomaterials**

The 2014 Annual Meeting of the American Institute for Chemical Engineers (AIChE), held Nov. 16-19 in Atlanta, was the site of the inaugural Area 8B Biomaterials Graduate Student Award Session. Created to honor graduate students whose research achievements in the broad area of biomaterials, demonstrate a high level of excellence, 8 finalists were selected to present at the meeting after review of CVs, reference letters, and copies of first author refereed research publications. The finalists presented their research in a 15-minute presentation, followed by 3-minute Q&A session, and a panel of four judges selected the three most impressive presentations for recognition. Congratulations once again to the inaugural winners!

1st Place: **Krishnan Iyer** (Northwestern University)
Presentation Title: *Superior Dispersion and Property Enhancements in Nanocrystalline Cellulose-Polyolefin Biocomposites Prepared Via Solid-State Shear Pulverization*

2nd Place: **Nan K. Li** (North Carolina State University)
Presentation Title: *Molecular Description of Solvent Responsive Behavior of Biomaterials*

3rd Place: **Shantanu Pradhan** (Auburn University)
Presentation Title: *PEG-Based Tumor Millibeads for Three-Dimensional Cancer Cell Culture*

**2014 Graduate Student Award Winners in Area 8E: Electronics and Photonics**

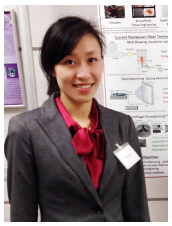
(left to right: Prof. Matthew Panzer (2014 Area 8E Chair), Saujan Sivaram (1st place), Ryan Crisp (2nd place), Dwaipayan Dasgupta (3rd place).

The 2014 AIChE Annual Meeting, held Nov. 16-21 in Atlanta, was the site of the inaugural Area 8E (Electronics and Photonics) Graduate Student Award Finalists session. This new event was created to honor outstanding graduate students whose academic performance and research accomplishments in the areas of electronic and photonic materials, modeling, or devices reflect the highest level of excellence and show significant promise for future achievements. Seven finalists were selected from a total of ten talented applicants to

present 15-minute talks highlighting their most significant research contributions to-date, followed by a five minute Q&A period conducted by a panel of four judges. The top three finalists were presented with their awards at the conclusion of the Area 8E Plenary: Recent Advances in Electronic and Photonic Materials session. The first place winner was **Saujan Sivaram** of Georgia Tech for his work developing *in situ* spectroscopy of semiconductor nanowire growth. Second place was awarded to **Ryan Crisp** (Colorado School of Mines/NREL) for contributions to the area of solution-processed metal chalcogenide photovoltaics. The third place winner was **Dwaipayan Dasgupta** (UMass - Amherst) for the computational modeling of electric field-driven surface stabilization and nanopatterning. The session organizers gratefully acknowledge financial support from a MESD seed grant that helped to make this event possible.

**2014 Student Poster Awards**

The AIChE Materials Engineering & Sciences Division held its annual student poster competition at the 2014 AIChE Annual Meeting in Atlanta. The poster competition included 36 entrants representing all five areas of the division: polymers, biomaterials, inorganic materials, electronic and photonic materials, and composites.



The first place winner was **Yichen Fang** (Department of Chemical Engineering, University of Texas at Austin), who presented a poster on the melt state centrifugal forcespinning of tin fluorophosphate microfibers.

The second place winner was **Ping-Hsun Chu** (Department of Chemical & Biomolecular Engineering, Georgia Tech), who presented a poster on field effect transistors composed of P3HT blends.

The third place winner was **Rishon Benjamin** (Department of Chemical and Biological Engineering, Drexel University), who presented a poster on alkaline fuel cells containing polymerized ionic liquid block copolymer membranes.

**Inorganic Materials Honorary Sessions for Professor Michael Tsapatsis**

At the 2014 AIChE Annual Meeting in Atlanta, two honorary sessions were organized for Professor Michael Tsapatsis, who received the Alpha Chi Sigma award in 2013 to honor his contributions to chemical engineering throughout his distinguished career. The Alpha Chi Sigma award, sponsored by the Alpha Chi Sigma Education Foundation since 1966,

recognizes an individual researcher's outstanding accomplishments in fundamental chemical engineering research. Professor Tsapatsis received the award in 2013 for his contributions to the areas of molecular sieve materials and membrane-based separations. Invited talks were delivered by fourteen speakers. choosen from among his colleagues, collaborators, and alumni. The presentations covered a wide range of areas to which Professor Tsapatsis has contributed, including materials synthesis and characterization, membrane science, interfacial engineering, molecular sieve catalysis, and separations processes. Professor Tsapatsis concluded the program with a talk reviewing the discovery and development of two-dimensional layered zeolite materials for thin film and nanocomposite applications. The honorary sessions were sponsored by Area 8D (Inorganic Materials) of the AIChE Materials Engineering and Sciences Division.

**Candidates for 2nd Vice Chair**
**(Vote for 1)**

**Thomas Dziubla, University of Kentucky**

**THOMAS DZIUBLA** is the Associate Gill Professor and Director of Graduate Studies in the Department of Chemical and Materials Engineering at the University of Kentucky. He received his B.S. and Ph.D in Chemical Engineering from Purdue University (1998) and Drexel University (2002), respectively. In 2002–2004, he was an NRSA postdoctoral fellow in the Institute for Environmental Medicine at the University of Pennsylvania School of Medicine. His research interests are in the design of new functional polymeric biomaterials, which can actively control local cellular oxidative stress for improved biomaterial integration and disease treatment. He holds 8 patents, has authored over 50 peer reviewed publications and, with Dr. Zach Hilt, started the company Bluegrass Advanced Materials, LLC, commercializing technology that has originated from their laboratories.

Tom has been an active member in AIChE since his time as a graduate student in 1998. He has chaired and co-chaired numerous sessions for 8a, 8b and 15d/e. He has also been actively involved in the Society for Biomaterials, where he has served as Programming chair for the Drug delivery special interest group for the past 4 years. In this capacity, he was successful in collaborating with a number of the other special interest groups to develop co-sponsored sessions as a means of having research presented reach a wider audience in an environment where the number of available sessions was limited. As the 2nd Vice Chair, I would like to assist the already excellent strides made by the MSED, and work to increase the number of co-sponsorship opportunities for the division and increase the reach and presence of MSED. In addition, I am also interested in pursuing ways in which the division can increase its connection with industry that on the whole are declining their attendance at national meetings. Maintaining industrial involvement is critical to the research mission and our professional development mission for graduate student members.

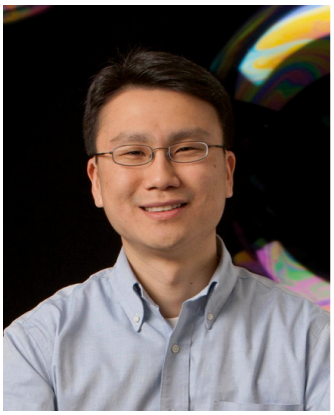
**Yossef Elabd, Texas A&M University**

**(JOE) Y. A. ELABD** is a Professor of Chemical Engineering at Texas A&M University. He received his PhD and BS both in Chemical Engineering from Johns Hopkins University and University of Maryland, Baltimore County, respectively. Prior to beginning his academic career, Joe served as an NRC postdoctoral fellow at the Army Research Laboratory. He has received the NSF CAREER Award, DuPont Science and Engineering Award, and ARO Young Investigator Award. His research interests include polymer science (ionic polymers, block copolymers, polymer membranes, polymer nanofibers, transport and thermodynamics in polymers) and electrochemical energy (fuel cells, batteries, capacitors). He has over 100 publications. Prof. Elabd is a member of AIChE, ACS, APS, ECS, and NAMS. He has served as symposium organizer and chair for many national conferences (*e.g.*, MRS, ACS) including raising funds for these symposia. He has also served as a guest editor for several special issues in journals (*e.g.*, *J. Polym. Sci. Polym. Phys., RSC Advances, Macromol. Rapid Comm.*). He is currently on the Editorial Advisor Board for *Macromolecules* and *ACS Macro Letters*.

Joe has been a member of AIChE since 1994 and chaired over 20 sessions at national AIChE meetings with most of these sessions in MESD. As Second Vice-Chair, Joe would pursue growth in MESD membership and involvement. Joe has successfully raised funds in the past for symposia and would like to establish a workshop to train young faculty in MESD to learn how to execute this for MESD sessions. Joe would also like to train young faculty to improve sessions by recruiting speakers for the sessions they chair. He will also pursue higher membership and involvement among industrial engineers. Additionally, he would like to improve student membership and involvement in MESD. Developing more sessions targeted toward professional development for graduate students within MESD will help to encourage more involvement.

**Candidates for MESD Director**
**(Vote for 2)**

**Daeyeon Lee, University of Pennsylvania**



**DAEYEON LEE** is currently an assistant professor of Chemical & Biomolecular Engineering at the University of Pennsylvania. He earned his B.S. in Chemical Engineering from Seoul National University, and his Ph.D. in Chemical Engineering from MIT.

I am very honored and grateful to have been nominated for this position. First and for most, I am excited to have the opportunity to work with the leadership of MESD in making our division one of the strongest and most exciting communities in AIChE. One of the most important roles of our division, I believe, is promoting the careers of young researchers. I am committed to doing whatever it takes to help MESD achieve this goal. In particular, I am very interested in expanding our presence and visibility on the international stage by launching collaborative programs with our counterparts in Chemical Engineering societies abroad. For example, exchanges of invited speakers between our division and Materials Divisions of Chemical Engineering societies in Korea and China will undoubtedly be beneficial for both parties and also provide opportunities for international collaborations and joint funding. My current role as the President of the US Chapter of KIChE (the Korean Institute of Chemical Engineers) gives me a unique opportunity to initiate such a plan with KIChE (KIChE is passionately pursuing international collaboration/joint symposium opportunities) and progressively expand our outreach to Chemical Engineering Societies in other countries. I am also very interested in further strengthening the participation of industry in our sessions, which we could initiate by inviting speakers from industry and also pursuing sponsorship of graduate student awards. This is a great opportunity for me and for our division, and I look forward to serving our community in whatever role possible.

**Matthew Panzer, Tufts University**

**MATTHEW PANZER** is an Associate Professor (as of Sept. 1) in the Department of Chemical & Biological Engineering at Tufts University in Medford, Massachusetts. He obtained an Honors Bachelor of Chemical Engineering with Distinction degree from the University of Delaware, and earned his Ph.D. in Chemical Engineering at the University of Minnesota under the direction of Prof. C. Daniel Frisbie with a thesis entitled “Polymer Electrolyte-Gated Organic Field-Effect Transistors.” Before joining the faculty at Tufts in 2009, Matt spent two years as a postdoctoral research associate in the Research Laboratory of Electronics at MIT working with Prof. Vladimir Bulović on the development of novel colloidal quantum dot LEDs. He has been the recipient of a Massachusetts Clean Energy Center Catalyst Program Award (2012), a NSF Graduate Research Fellowship, an IGERT for Nanoparticle Science & Engineering Graduate Fellowship, and the Eugene duPont Memorial Distinguished Scholar Award. In 2014, Matt received the Tufts University Recognition of Undergraduate Teaching Excellence (ROUTE) Award, and in 2015 he received the Henry and Madeline Fischer Award (Teacher of the Year) from the Tufts School of Engineering. His current research interests are focused on novel materials (such as ionic liquid-based gel electrolytes and electrodeposited metal oxide semiconductors) and architectures for realizing flexible, solution-processed optoelectronics, including: supercapacitors, photovoltaics, and light-emitting devices. He has published 35 peer-reviewed journal articles, 2 book chapters, and holds 1 U.S. patent.

Matt has been an active member of AIChE since 2003 and is a strong supporter of the Materials Engineering & Sciences Division. In recent years, he has served as session chair within Area 8E (Electronics & Photonics) at the 2012 and 2013 AIChE Annual Meetings, as the Area 8E Co-Chair in 2013, and as the Area 8E Chair in 2014. In 2013, Matt successfully applied for seed funding from MESD to create a new Area 8E Graduate Student Awards session to recognize outstanding graduate student research contributions to electronic and photonic materials, modeling, or devices. He organized and chaired this

session, along with a new Area 8E Plenary session (Recent Advances in Electronic and Photonic Materials) at the 2014 Annual Meeting. As a Director, Matt will continue to work hard to build new opportunities to engage students, faculty, and professional members across the Division and to enhance the visibility of MESD within AIChE.

**Shelly Peyton, University of Massachusetts**

**SHELLY PEYTON** is the Barry and Afsaneh Siadat Assistant Professor of Chemical Engineering at the University of Massachusetts, Amherst. She received her B.S. in Chemical Engineering from Northwestern University in 2002 and went on to obtain her MS and PhD in Chemical Engineering from the University of California, Irvine. She was then an NIH Kirschstein post-doctoral fellow in the Biological Engineering department at MIT before starting her academic appointment at UMass in 2011. Her research interests are in biomaterial design and understanding how cell-material interactions contribute to cancer aggressiveness, cardiovascular disease progression, and regenerative medicine. Since arriving at UMass she has been named a Pew Biomedical Scholar, received a New Innovator Award from the NIH, and she was recently awarded a CAREER grant from the NSF.

Shelly has been an active member of AIChE since 2004 and has chaired many sessions in 8B and 15D/E. She is the Area Chair of 15D/E for the 2016 fall meeting. She is also an active member of the Biomedical Engineering Society. In a director's position with MESD, she would prioritize increasing the quality of the MESD elements of the AIChE annual meeting, increasing student advocacy at the university level for AIChE, and strategize new ideas for overlapping special interests between MESD and other divisions within AIChE. These efforts are likely to increase membership in MESD and AIChE, particularly for students and industry.

**Megan Robertson, University of Houston**

**MEGAN ROBERTSON** is an Assistant Professor of Chemical and Biomolecular Engineering at the University of Houston. After earning a B.S. in Chemical Engineering from Washington University in St. Louis (2001) and Ph.D. in Chemical Engineering from the University of California, Berkeley (2006), she worked at Rohm and Haas (now Dow Chemical) as a Senior Scientist in Spring House, PA for one year and then completed a postdoctoral research appointment at the University of Minnesota. She started a faculty appointment at the University of Houston in 2010. Megan's research interests include the synthesis, self-assembly, and physical properties of structured polymers. Current areas of emphasis include polymers derived from renewable resources, biomedical materials, polymers for wind energy applications, and antifouling coatings.

Megan has been an active member of Area 8A (Polymers) in MESD since 2010. She has chaired and co-chaired numerous scientific sessions in Area 8A. At the 2014 AIChE meeting, she organized the poster session for MESD, which included coordination of judges to award the student poster prizes. In the 2015 AIChE meeting, she will serve as a chair for the Plenary Session in Area 8A. Megan is also actively involved in other scientific organizations that serve the materials community. She has served as a symposium organizer at APS (DPOLY) and ACS (PMSE), is a member of the Editorial Advisory Board of *Macromolecules* and *ACS Macro Letters*, and is a member of the executive committees of the user groups at the Center for Nanophase Materials Sciences (ORNL), NIST Center for Neutron Research, and Neutron Scattering Society of America. If elected as a director of MESD, Megan will focus her efforts on enhancing opportunities for interactions among senior and junior scientists within MESD at AIChE meetings. The following activities will be undertaken: 1) Increasing the number of industrial speakers, which may lead to opportunities for collaboration between industrial and academic scientists; 2) Increasing collaboration between the areas within MESD, particularly in the development of new programming for future meetings; and 3) Promoting opportunities for students and postdocs at

the meeting, such as the development of funded student prize symposia and travel awards.

**Candidate for Treasurer/Secretary**
**(Vote for 1)**

**Edmund G. Seebauer – University of Illinois**

**EDMUND G. SEEBAUER** is the James W. Westwater Professor of Chemical & Biomolecular Engineering at the University of Illinois at Urbana-Champaign, where he has served on the faculty since 1988 (including department head 2005-11, and special-assignment associate provost 2011-14 for international academic programs). He received his BS from the University of Illinois in 1983, and his PhD from the University of Minnesota in 1986 – both degrees in chemical engineering. He did a year of postdoctoral work at Sandia National Laboratories in Albuquerque in 1987. His early research focused upon basic surface science of metals and semiconductors with a special emphasis on surface diffusion. His more recent work has focused upon employing surface chemistry to control the interaction of bulk point defects with silicon and metal oxide surfaces. He has received a Presidential Young Investigator Award, Sloan Research Fellowship in Chemistry, and Inventor Recognition Award from Semiconductor Research Corporation. He is a Fellow of AVS (2001), AAAS (2007), APS (2008) and AIChE (2011). He is also a member of the MRS, ECS and IEEE (for which he has served as a Distinguished Lecturer). He has co-authored two books, 4 US patents, and roughly 190 other book chapters, journal articles and conference publications.

Ed has organized conference programming for several professional societies and served in numerous elected positions within them, including AIChE (MESD, succeeding from 2nd Vice-Chair through 1st Vice-Chair through Chair to Past Chair 2007-11, Director 2012-14), AVS (MSTG Co-Chair, 2002–13; Treasurer, 2000–13), and AAAS (Electorate Nominating Committee for sections in both Engineering and Industrial Science & Technology, 2013-16). As Treasurer/Secretary of MESD, he would continue the tradition of careful and responsible financial stewardship that has long characterized the division, and would steward the ongoing meeting minutes and other division records and correspondence at the same high level of professionalism. He would also draw upon his long history of experience in MESD leadership as a resource for Executive Council decision-making whenever needed.

**Ryan Toomey, University of South Florida**

**RYAN TOOMEY** is an Associate Professor in the Department of Chemical and Biomedical Engineering at the University of South Florida (USF). Ryan Toomey received his Bachelor's degree in Chemical Engineering from the University of California Berkeley in 1995 and his PhD in Chemical Engineering at the University of Minnesota in 2002, followed by a post-doctoral position at the University of Freiburg in 2003. He joined USF in 2005. His research is in the area of polymers and gels, especially the physics of polymers that deform under external stimuli, including electric, magnetic, and thermal cues. His main technological interest involves the development of polymer coatings that can change properties on command. He is the recipient of a Camille and Henry Dreyfus New Faculty Award and an NSF CAREER Award.

Ryan has been active with AIChE since 2005 and has chaired numerous sessions in Areas 8A. He is currently the first vice-chair of the Students Chapter Subcommittee (SCC), and is organizing the undergraduate poster symposium at the upcoming 2015 AICHE Student National Conference. He is also the faculty advisor for the AICHE student chapter at USF, who just hosted the Southern Regional Student Conference in 2015. He has also been active as a member in APS and ACS, where he is a session organizer in 2016.

## 2014-2015 MESD Officers

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**MESD Sponsors**

**Owen Corning Early Career Award:** Owen Corning