

# MESD Division Newsletter

**Volume 49 Issue 1****October 2018**

## Notes from the Chair

Dear MESD Members and Friends,

On behalf of MESD, I would like to thank you all for your dedication, contributions, and participation to one of the strongest and most vibrant divisions of AIChE! I am looking forward to an exciting meeting in Pittsburgh this October. Specifically, I am excited to announce our Division awardees, who will present on Wednesday, October 31<sup>st</sup> in our Division Plenary Session. The Braskem Award for Excellence in Materials Engineering and Science will be presented to Prof. Zhen-Gang Wang (California Institute of Technology) "for theoretical contributions to the understanding of thermodynamics and phase transitions in heterogeneous polymer systems, especially charged systems." The Owens-Corning Early Career Award will be presented to Prof. Christopher Jewell (University of Maryland) "for innovative work providing new understanding of the interactions between synthetic materials and immune tissues, and that enables novel carriers that help actively direct immunity." Additionally, the Division Plenary will feature talks by Prof. Kathleen Stebe (University of Pennsylvania), Prof. Sanat Kumar (Columbia University), and Prof. Jane Chang (University of California, Los Angeles). Additionally, many MESD Areas have plenary and graduate student award sessions. I congratulate the efforts of Area chairs for their hard work in assembling excellent sessions and raising funds to support these efforts. Specifically, I congratulate MESD Area chairs who raised funds and organized new industrial speaker sessions this year. I am really looking forward to our MESD sessions this year at the Annual Meeting!

I would also like to thank our 1<sup>st</sup> vice chair, Prof. Liz Lipke (Auburn University), for her excellent work in organizing all of the MESD programming for our upcoming Annual Meeting in Pittsburgh. Her leadership has guided MESD to an exciting line up of outstanding sessions that highlight cutting-edge research. Additionally, MESD will feature a poster

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session on Monday, October 29<sup>th</sup>, from 3:30-5:00 p.m. No other MESD oral sessions will run during this time slot. This will allow our members to have time to fully engage with poster presenters without distraction. Refreshments will be provided at the poster session, so I hope you will join us there!

I would also like to point out that MESD elections are currently ongoing, so I urge you to cast your vote! Biographies and statements are included in the ballot and in this newsletter. I appreciate all who are running in the election and are willing to serve MESD. Thanks to MESD director Prof. Bryan Boudouris (Purdue University), who led the efforts of the nominating committee. We are always looking for enthusiastic MESD members to contribute, and I hope that you will attend your Area's business meeting on Tuesday, October 30<sup>th</sup>, from 6:00-7:00 p.m. to give input into future programming and elect new Area leaders.

In closing, I want to thank the MESD Executive Council and Area chairs and co-chairs. I have enjoyed working with all of you these past few years, and I am confident Prof. Elizabeth Lipke (Auburn University) and Prof. Jodie Lutkenhaus (Texas A&M University) will continue to improve MESD programming and operations. I look forward to seeing you in Pittsburgh!



Joe Elabd

Chair, MESD 2017-2018

Professor, Department of Chemical Engineering,  
Texas A&M University

## 2017 MESD Plenary and Poster Awards

At the 2017 MESD Plenary, Prof. Shaoyi Jiang (University of Washington) received the Braskem Award for Excellence in Materials Engineering and Science, and Prof. Rodney Priestly (Princeton University) received the Owens Corning Early Career Award.



**Presentation of the Owens Corning Early Career Award.** Prof. Chris Ellison (University of Minnesota, Owens Corning Early Career Award chair) (left) and Prof. Julie Liu (right) present the award to Prof. Rodney Priestly (middle).



**Presentation of the Braskem Award for Excellence in Materials Engineering and Science.** Braskem America representative (left) and Prof. Julie Liu (right) present the award to Prof. Shaoyi Jiang (middle).

Graduate Student Poster Award and MESD Undergraduate Student Poster Award winners were announced. Both competitions gather contributions from all five areas of the division: polymers, biomaterials, inorganic materials, electronic and photonic materials, and composites.

## 2017 Graduate Student Winners

- 1<sup>st</sup> place: **Thomas Gartner**, University of Delaware  
Title: Influence of Molecular Design on the Self-Assembly of Single-Stranded DNA Amphiphiles
- 2<sup>nd</sup> place: **Amanda Hoskins**, University of Colorado at Boulder  
Title: Computational Screening of High Temperature Materials for Environmental Barrier Thin Films
- 3<sup>rd</sup> place: **Janani Sampath**, The Ohio State University  
Title: Effect of Electric Field on the Structure and Dynamics of Model Ionomer Melts



**Recognition of the Graduate Student Poster Awards.** Pictured (from left to right) are Amanda Hoskins, Thomas Gartner, Prof. Julie Liu (past Chair of MESD), and Janani Sampath.

## 2017 Undergraduate Student Winners

- 1<sup>st</sup> place: **Victoria Muir**, University of Delaware  
Title: Efficient Tuning of siRNA Dose Response by Combining Mixed Polymer Nanocarriers with Simple Kinetic Modeling
- 2<sup>nd</sup> place: **Mischa Hubbard**, University of New Mexico  
Title: Potential of Mesoporous Silica Nanoparticles as Small Molecule Delivery Platform Against Pathogenic Bacteria



3<sup>rd</sup> place: **Ian Dunn**, Rowan University  
 Title: Preparation and Characterization of Bio-Based Polyester Derived from Xylochemicals

### 2017 Area 8A (Polymers) Graduate Student Awards (Sponsored by Journal of Polymer Science)

1st place: **Kevin Gu**, Stanford University  
 Title: High Performance Roll-to-Roll Printed PTB7-Th/PCBM Organic Solar Cells  
 Advisor: Prof. Zhenan Bao

2nd place: **Akash Arora**, University of Minnesota  
 Title: Predicting Stable and Metastable Frank-Kasper Phases in Block Copolymers  
 Advisor: Profs. Frank Bates & Kevin Dorfman

3rd place: **Jelena Dinic**, University of Illinois, Chicago  
 Title: Pinch-Off Dynamics, Dripping-onto-Substrate (DoS) Rheometry and Printability of Polymeric Complex Fluids  
 Advisor: Prof. Vivek Sharma

### 2017 Area 8B (Biomaterials) Plenary



**Speakers and organizers of the 8B plenary session: “Leaders in Biomaterials.”** Pictured from left to right are Profs. Eun Ji Chung (USC, organizer), Tatiana Segura (Duke, speaker), Tejal Desai (UCSF, speaker), Ali Khademhosseini (UCLA, speaker), and Shannon Servoss (U AR, organizer).

### 2017 Area 8B (Biomaterials) Graduate Student Awards

1st place: **Lisa Kasiewicz**, Carnegie Mellon University  
 Title: Understanding How Lipid Nanoparticle Structure Affects Immune Response  
 Advisor: Prof. Kathryn Whitehead

2nd place: **Connie Wu**, MIT  
 Title: Pegylated Poly(beta-amino ester) Delivery Systems for Periodic shRNA  
 Advisor: Prof. Paula Hammond

3rd place: **Danielle Konetski**, University of Colorado, Boulder  
 Title: Photo-Induced Pinocytosis in Synthetic Liposomes  
 Advisor: Prof. Christopher Bowman



**Recognition of the 8B Graduate Student Award Winners.** Pictured (from left to right) are Danielle Konetski, Connie Wu, and Lisa Kasiewicz.

## Liu Recognized for Service to MESD

At the conclusion of the 2017 Executive Council meeting, we thanked Prof. Julie Liu for her service to MESD as chair (2016-2017), vice chair (2015-2014), and 2<sup>nd</sup> vice chair (2014-2015).



**Recognition of Service to MESD.** Prof. Joe Elabd (left, 1<sup>st</sup> Vice Chair, 2016-2017) presents a plaque commemorating Prof. Julie Liu's (right, Chair 2016-2017) service to MESD.

## Biographical Sketches and Statements of Nominees

### CANDIDATES FOR 2<sup>ND</sup> VICE CHAIR (VOTE FOR 1)

#### Bradley Olsen, MIT



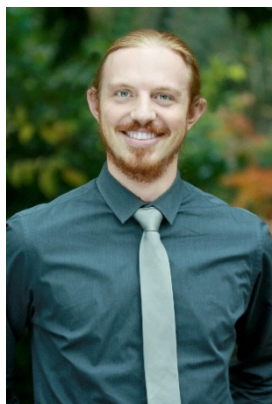
**BRADLEY OLSEN** is an Associate Professor in the Department of Chemical Engineering at MIT. He earned his S.B. in Chemical Engineering at MIT in 2003, his Ph.D. in Chemical Engineering at the University of California, Berkeley in 2007, and was a postdoctoral scholar at the California Institute of Technology in the

Division of Chemistry and Chemical Engineering from 2008 to 2009. He started as an assistant professor at MIT in December 2009. Olsen's research expertise is in materials chemistry and polymer physics, with a particular emphasis on protein biomaterials, polymer networks and gels, and block copolymer self-assembly. He has been recognized with the ACS POLY Mark Young Scholar award, the AIChE Colburn award, a Dreyfus Teacher-Scholar Award, and the APS Dillon Medal. He is on the editorial board of *Soft Matter* and *Physical Review Materials* and serves as an associate editor for *Materials Science and Engineering Reports*. Brad has been an active member of MESD and area 8A since graduate school, organizing sessions in 8A and serving as the chair and vice-chair of 8A from 2013 to 2015. Brad has also previously served as a program co-chair (2015-2018) and member-at-large (2013-2014) for ACS PMSE, and he helped to co-found an international collaborative program between ACS PMSE and Brazil.

As second vice chair, Brad's aim would be to continue the strong traditions of quality in this division while broadening the appeal of MESD

beyond the core strength of service to the academy. He would like to better understand how the needs of industrial members and graduate students and postdocs not headed for academic jobs may be served, and if there is potential to increase the global appeal of MESD. He is very excited by synergies that he has seen develop between areas and recent grass-roots advances in programming best practices that come from each area, and he would like to continue support for this type of collaboration and innovation if serving in a MESD-level role.

### **Cole DeForest, University of Washington**



**COLE A. DEFOREST** is an Assistant Professor in the Department of Chemical Engineering at the University of Washington, where he began in 2014. He received his B.S.E. degree from Princeton University in 2006, majoring in Chemical Engineering and minoring in Material Science Engineering and Bioengineering. He obtained his Ph.D. under the

guidance of Dr. Kristi Anseth from the University of Colorado in Chemical and Biological Engineering with an additional certificate in Molecular Biophysics. His postdoctoral research was performed with Dr. David Tirrell in the Divisions of Chemistry and Chemical Engineering at the California Institute of Technology. He has authored >30 articles in peer-reviewed journals including *Nature Materials*, *Nature Chemistry*, *Advanced Materials*, and *Angewandte Chemie*. Cole has received numerous research and teaching awards, most recently including the AIChE 35 Under 35 Award (2017), NSF CAREER Award (2017), ACS PMSE Young Investigator Award (2017), and the University of Washington Distinguished Teaching Award (2016). His research on designing user-programmable materials to direct 4D stem cell differentiation has been supported through fellowships and grants from the National Science Foundation, the National Institutes of Health, and the US Department of Education.

Cole has been involved as an active member and ambassador for AIChE for the past 13 years. Building on his undergraduate experience as the Vice President of the Princeton AIChE student chapter, he has gone on to chair numerous MESD sessions,

present or co-author ~10 AIChE talks, and serve as one of the faculty advisors for the University of Washington's AIChE student chapter. Within the Institute, Cole has served as the MESD Area 8B Vice Chair for 2016 and 2017, as well as the Area 8B Chair for 2018. In this role, Cole and his co-Chairs helped increase 8B abstract submissions and session numbers by 30%, organize a successful new member meet-and-greet, fundraise approximately \$10k in sponsorship, and establish a fruitful collaboration with the newly formed Regenerative Engineering Society. Beyond AIChE, he established the "Young Biomaterial Scientist" group within the Society for Biomaterials and has planned several symposia for the American Chemical Society. If elected as 2<sup>nd</sup> Vice Chair, Cole will seek to standardize opportunities and coordinate efforts within MESD, improve communication amongst its different Areas, and decrease programming redundancy and scheduling conflicts between divisions through expanded session co-sponsorship. By establishing new graduate student presentation awards and career development-associated programming, Cole will help strengthen AIChE's continued institutional appeal to the next generation of Chemical Engineers. As an active participant with AIChE since 2005 and at the MESD Executive Council meetings since 2016, Cole is well-prepared to advance the goals of the MESD.

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### **CANDIDATES FOR DIRECTOR (VOTE FOR 2)**

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### **Matthew Panzer, Tufts University**



**MATTHEW J. PANZER** has been an active member of AIChE since 2003 and a vigorous supporter of the Materials Engineering & Sciences Division. He served as the Area 8E Co-Chair in 2013 and as the Area 8E Chair for the 2014 Annual Meeting. In 2013, he successfully applied

for MESD seed funding to create a new Area 8E Graduate Student Awards session in order to recognize outstanding graduate student research contributions to electronic and photonic materials,



modeling, or devices. he then 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. His current research activities are focused on ionic liquid/polymer gel composite electrolytes for developing safer batteries and other electrochemical devices, and my students and he has given presentations both in Area 8A and Area 8E sessions in recent years. If elected as a Director, he will continue to work hard to build new opportunities to engage with students, faculty, and professional members across the Division, and to enhance the visibility of MESD within AIChE.

Matthew Panzer is an Associate Professor and Graduate Program Chair 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. Matt is a two-time recipient of the Massachusetts Clean Energy Center Catalyst Program Award (2012, 2017), and has been recognized with several teaching/mentoring awards at Tufts, including: the Lillian and Joseph Leibner Award for Distinguished Teaching and Advising (2016), the Henry and Madeline Fischer Award (2015), and the Recognition of Undergraduate Teaching Excellence (ROUTE) Award (2014). He has published 44 peer-reviewed journal articles, 3 book chapters, and holds 3 issued U.S. patents.

#### **Amy Peterson, University of Massachusetts Lowell**

**AMY PETERSON** is excited to be running for the position of MESD director. She has been involved in 8A for the past five years and has chaired a variety of sessions, including a new session on additive manufacturing that she proposed. This



year, she is co-chairing the 8A Emerging Areas in Polymer Science Plenary. AIChE has played a critical role in her career, starting from her first conference presentation in an 8F session at the 2008 AIChE Annual Meeting. If elected as a MESD director, her goals will be to 1) Promote an environment within MESD that supports a diversity of thoughts, perspectives and experiences, and honors the identities of all participants; 2) Expand outreach to industry and national labs to increase non-academic participation in MESD; 3) Increase MESD's social media presence (Twitter account, hashtags for the conference, highlighting MESD member activities, etc.), which will facilitate greater awareness of MESD and a greater sense of community throughout the year and not just at AIChE.

Amy Peterson is an Associate Professor of Plastics Engineering at University of Massachusetts Lowell. Her research group studies processing-structure-property relationships in polymers and polymer composites, with a focus on interfacial phenomena in layer-by-layer systems. She received her PhD in 2011 from Drexel University, where she was an NSF IGERT and Graduate Research Fellow, under the advisement of Giuseppe Palmese. She was an Alexander von Humboldt Postdoctoral Fellow at the Max Planck Institute of Colloids and Interfaces 2011-2013 with Helmuth Möhwald and Dmitry Shchukin. In 2013, she joined Worcester Polytechnic Institute as the Leonard P. Kinnicutt Assistant Professor of Chemical Engineering. In 2018, she moved to University of Massachusetts Lowell. She serves as an Editorial Board Member for Scientific Reports.

#### **Eric Davis, Clemson University**



**ERIC M. DAVIS** is an active member of AIChE since 2009 and excited to be nominated for one of the AIChE MESD Division 8 Director positions. The MESD (Division 8A) is his 'home' division within AIChE and has provided him with numerous opportunities to advance and grow as a scientist, thus he feels very invested in the continued success of this division. He believes

that his previous experience and genuine desire to serve the MESD community will make him well-suited for such a position. Through his various leadership

roles at the departmental- and college-levels at Clemson University, he has gained valuable insight into how important both organizational culture and structure are to the growth and maturation of a team or organization. If elected to this position, he will work closely with the other Directors to advise and assist the Division Chair and Vice Chairs in the development and implementation of forward-thinking strategies that foster improvement within AIChE and the MESD community. He does not take the responsibility that comes with this role lightly, and he looks forward to supporting the MESD moving forward.

Eric M. Davis received his B.S. in Chemical Engineering from Clemson University and his Ph.D. in Chemical Engineering from Drexel University, where he studied under Yossef Elabd. Before joining Clemson University in 2015, he was a National Research Council postdoctoral fellow in the Materials Science and Engineering Division at the National Institute of Standards and Technology. Eric's research group focuses on the development of structure-processing-property relationships of polymer membranes for energy storage and delivery applications, as well as membranes for water desalination and moisture barrier applications.

### Jason Bara, University of Alabama



**JASON E. BARA** is an Associate Professor of Chemical & Biological Engineering at the University of Alabama. Jason received a B.S. in Chemical Engineering from Virginia Commonwealth University in 2002 and a Ph.D. in Chemical Engineering from the University of Colorado at Boulder in 2007. Jason continued at CU-Boulder as a postdoctoral fellow

jointly appointed in Chemical Engineering and Chemistry until 2009, also co-founding a small business during this period. Jason started his independent research group in 2010.

Jason has authored more than 75 peer-reviewed research publications and 5 book chapters on the topics of CO<sub>2</sub> capture, ionic liquids, polymer membranes, nanostructured materials, and chemical process engineering. He has also been awarded 9 U.S. patents for discoveries in these areas. His work has been funded by DOE, NSF, NASA, ACS-PRF and

industry. Jason was selected as the 2018 winner of the Ray W. Fahien Award for excellence in chemical engineering education from the Chemical Engineering Division of ASEE, the 2017 winner of the David Himmelblau Award for Innovations in Computer-Based Chemical Engineering Education Award from the CAST Division of AIChE, and the 2015 winner of FRI/John G. Kunesh Award from the Separations Division.

Jason has been active in AIChE throughout his career, having served as the VCU AIChE student chapter president in his senior year. Over the past 8 years as a faculty member, Jason has chaired at least 2 sessions on average at each national meeting since 2010 across a number of divisions. He also served on the AIChE national undergraduate Mobile App Competition Committee and has been faculty advisor to the University of Alabama AIChE student chapter for the past 6 years. If elected as a director of MESD, Jason will work with the other directors to increase awards, especially for graduate student travel. Jason will also work to develop new conference programming to engage with chemical engineers from industry and government and also appeal to materials scientists with backgrounds in other disciplines.

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### CANDIDATES FOR SECRETARY/TREASURER (VOTE FOR 1)

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### 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 Area 8A. He is currently the 2016-2017 secretary-treasurer of the Materials and Engineering Sciences Division (MESD), chair of the Students Chapter Subcommittee (SCC) of AIChE, and co-organizer of the undergraduate poster competition for the 2016 National AIChE student conference. He has also been the faculty advisor for the AIChE student chapter at USF since 2007, which has received the AIChE Outstanding Chapter Award for the last 5 years in a row.



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