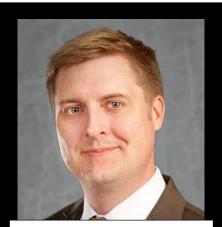
### **ASEE Chemical Engineering Division Newsletter**

Editor: Elif Eda Miskioğlu, Bucknell University (elif.miskioglu@bucknell.edu)

### A Message from the Chair:



Matthew Cooper
North Carolina State Univ.

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#### <u>Call for Community</u> Announcements

Please send any announcements you'd like included in the Fall 2020 newsletter to elif.miskioglu@bucknell.edu. Deadlines for publication will be announced in the early fall.

The environment from which I write you today is quite different than our last newsletter. By this time we've all stepped up to the challenge of moving our classes online in almost no time at all, dealt with big changes to our home lives, and are



left wondering what's coming next. I for one am now starting to sift through the mental rubble. I'm used to the typical emotions associated with wrapping up the Spring semester, students graduating, etc. I'm still looking forward to teaching a summer course and writing proposals. However, my feelings as I look forward to the summer aren't quite as usual. Longanticipated trips to visit family (a once-in-a-lifetime trip to NYC with my parents), friends (a beach house reunion with old poker pals) and colleagues (I'm really going to miss doing division chair tasks in beautiful Montreal – we had been planning a fun CHED social hour on a rooftop patio) are no longer there to serve as the carrot to which I can look forward.

At the same time, perhaps I am long overdue for an extended moment of repose. We are under a tremendous amount of stress as faculty members, and we've developed strategies not to let it get to us. Filling the summers with healthy doses of visits with family/friends/colleagues has long been one of my strategies to de-stress, but even these happy times bring their own flavor of good, yet hectic stress. Maybe "turning my head off" more often this summer – keeping up with long walks with the dog, playing around in the garden more, trying out new recipes in the kitchen – will bring unexpected short- and long-term benefits. Right?

Different though it may be, I am still looking forward to seeing everyone's work in what will be remembered as a unique ASEE conference for our ChE Division. Taryn Bayles has done a great job managing our technical program through the pandemic-response impacts, and we still have business to manage — namely the elections of new officers. Elif Miskioglu has kindly put together this issue of our newsletter which contains candidates for this year's elections. Be sure to vote using the link provided in my announcements email — the deadline for responses is June 5.



Hang in there, everyone.

Yours,

### **ChED Elections: Summary of Candidates**

# Candidate for Division Chair-Elect

Winner will serve as chair of ChE Division for 2020-2021



Tony Butterfield University of Utah

## Candidates for Director

Winner will serve as an advisor to the executive board for a term of 2 years



Sarah Wilson University of Kentucky



Elif Eda Miskioğlu Bucknell University

Vote <u>here</u> by Friday, June 5<sup>th</sup>!

### **ChED Elections: Candidate for Chair-Elect**

I am grateful and honored to be nominated for the position of Chair-Elect of ASEE's Chemical Engineering Division. This Division and its members have been a vital, positive force in my professional development over my decade as an educator, and I very much appreciate the opportunity to give back in service.

I received my B.S. and Ph.D. degrees from the University of Utah and received my M.S. from University of California, San Diego. I worked in the medical device industry for a while and never thought of myself as the type to enter academia. However, I fell in love with teaching after filling in for a colleague and I've been teaching at the University of Utah ever since. I am currently an Associate Professor (Lecturer). I teach our department's introductory course and design lab, and have the fortune of seeing the same students as seniors in our unit ops series. I advise our AIChE student chapter, Chem E Car team, oSTEM group, and lead our department's K-12 outreach team.



Tony Butterfield University of Utah

My pedagogical research has focused on the use of low-cost microcontrollers in chemical engineering education; pairing simulated experiments with hands-on counterparts; and the optimization of team-based design experiences within maker spaces in early chemical engineering curriculum. With my outreach program, I have also investigated models of K-12 outreach and involvement of citizen scientists in engineering research. Outside of education, my research involves photobioreactor design and the use of large distributed sensor networks to better understand particulate pollution.

For the broader community, I have been active in the Chemical Engineering Division of ASEE, publishing my work and serving as a division board member since 2015. I currently also serve as a member of AIChE's Societal Impact Operating Council (SIOC). As a member of SIOC, I have worked to initiate a LGBTQ+ & Allies Initiative for AIChE's Doing a World of Good initiative.

I have received my department's teaching award three times, by vote of the student body. I have received my college's teaching award, and the University of Utah's Beacon of Excellence Award, for innovating our curriculum and strengthening our K-12 outreach and mentoring efforts. I received the national GLBT Educator of the Year Award from NOGLSTP, for my work to develop an inclusive engineering culture. I received the 2017 Award for Innovation in Chemical Engineering Education from AIChE. I was part of teams which were awarded 2018's Best Poster award from ASEE's Education Division, and the Corcoran Award for 2018's best paper in the journal Chemical Engineering Education. Finally, I was recently won the 2020 University of Utah Distinguished Teaching Award.

This division and the people who have made it into a welcoming community have taught me so much. By taking the great work of even one teacher, in one small classroom, and bringing to the broader community, this division has the potential to improve the teaching of hundreds of faculty and benefit the educational trajectory of many students. I look forward to doing my part to increase our membership, boost inclusion in chemical engineering, elevate our programming, and disseminate the innovative work that is being conducted within our division. Thank you for your consideration.

### **ChED Elections: Candidate for Director**

First, I would like to thank you for identifying me as a candidate for Director in the Chemical Engineering Division of ASEE. I have been exposed to excellence in chemical engineering education since the beginning of my undergraduate career at Rowan University. My experience at Rowan helped to shape my career goals to become both an educator and a mentor for undergraduate chemical engineering students. Since 2015, I have led a career directed around undergraduate education as a lecturer at the University of Kentucky. My enthusiasm in the classroom, focus on applied engineering and passion for student success has been recognized by students within the department and college, allowing me to receive several student-nominated departmental and college teaching awards. Additionally, in 2019 I was one of six university faculty awarded with a Provost Award for Outstanding Teaching.

Sarah Wilson University of Kentucky

As a regular attendee at the ASEE National Conference, I have developed a passion for research in engineering education with focus areas in communications, process safety and mental health. In 2017, I

began my first project directed at characterizing the communication skills required of engineers after graduation. In collaboration with faculty from the college of communications, we developed a workshop to teach intern students practical communication skills with diverse audiences. Since 2018, I have worked with six faculty that I met through ASEE to integrate process safety learning tools into chemical engineering unit operations laboratories. Recently, I established a collaboration with faculty from educational psychology and counseling psychology to analyze national data with a goal of identifying factors influencing mental health in engineering student populations. Through these results, we have designed a study to better understand the key beliefs influencing mental health related help-seeking behavior in engineering students.

My experiences with ASEE through National Conferences and the ASEE Summer School have helped to shape me as an educator and a researcher. I have quickly learned that the chemical engineering education community is filled with passionate and supportive educators who strive to continuously improve their ability to train young engineers. To further my personal growth and contribute to the growth of this community, I aim to increase my involvement in the leadership of ASEE as Director in the Chemical Engineering Division. Thank you for your consideration.

### **ChED Elections: Candidate for Director**

My interest in pursuing an academic career has always been motivated by a strong desire to improve engineering education, and I was immediately thrilled when I discovered engineering education was itself an area of scholarship. This excitement was accompanied by a tension – how could I merge my interest in engineering education scholarship with my equally strong passion for my technical discipline of chemical and genetic engineering? Enter ASEE Chemical Engineering Division! ChED has been truly instrumental in supporting me through my transition to engineering education scholarship and navigating my early career.

Much has changed in the decade since my journey began, but my interests and motivation remain the same. As an Assistant Professor of Chemical Engineering at Bucknell University, I have the absolute joy and pleasure of teaching core courses in chemical engineering and electives in genetic engineering and professional communication. While my scholarship has expanded to focus on engineering broadly across many disciplines, it has been heavily molded by my foundation as a chemical



Elif Eda Miskioğlu Bucknell University

engineer. My brief time co-oping with Dow Chemical as an undergraduate gave me a lens into process engineering and industry through which I continue to assess education. The desire to bridge the gap between the classroom and "real-life" engineering continuously drives my research direction. I am specifically interested in: 1) understanding the development of expertise and expert judgement, and 2) developing more effective means for supporting underrepresented minorities in engineering.

I am honored to be nominated for the position of Director. My role as the Division Newsletter Editor has given me a window into the inner workings of the executive board, and an even greater appreciation for the hard work and dedication involved in supporting our community. I have been particularly uplifted by our immense care for each other, and commitment to lowering barriers to participation and engagement for existing or potential members. This care is even more critical in current times, and I look forward to continuing to support, and be supported by, this community. Thank you for your time and consideration, and stay well.

Vote <u>here</u> by Friday, June 5<sup>th</sup>!



Nothing can stop us from having a conference. So how are we doing it this year?

By bringing it to a home office near you. Actually, the one you're in now.

You get the benefits of a regular, in-person conference, and more:

- Every single attendee has a front row seat
- Your ability to hear or see speakers is equal
- Recordings of every presentation available for a year—no scheduling conflicts
- Back-channel networking opportunities, and Q&A throughout the conference

And, you can register for less than in-person conference rates.\*

<sup>\*</sup>limited scholarships available from ASEE for \$200.

#### Monday, June 22<sup>nd</sup>

#### M205: Chemical Engineering in K-12 and the First Year

10:00 AM to 10:20 AM EDT

Moderators: Dr. Margot A Vigeant and Katelyn Dahlke

1. Clean Water through Chemical Engineering: Introducing K-12 Students to ChE Using Filtration

Dr. Ashlee N Ford Versypt (Oklahoma State University) and Dr. Daria Khvostichenko (University of Illinois at Urbana-Champaign)

- 2. First Impressions: Engaging First-Year Undergraduates in Chemical Engineering Design
  Tommy George (Harvard University), Alexander Seth Klein (Affiliation unknown), and Dr. Kristen B
  Wendell (Tufts University)
- 3. The Design and Impact of a Combined Makerspace, Wet Lab, and Instructional Design Studio for Chemical Engineering Curriculum

Prof. Anthony Butterfield (University of Utah)

4. How We Teach: Chemical Engineering in the First Year

Dr. Laura P Ford (The University of Tulsa), Dr. Janie Brennan (Washington University in St. Louis), Dr. Jennifer Cole (Northwestern University), Dr. Kevin D. Dahm (Rowan University), Prof. Marnie V Jamieson (University of Alberta), Dr. Lucas James Landherr (Northeastern University), Dr. David L. Silverstein P.E. (University of Kentucky), Dr. Bruce K Vaughen P.E. (American Institute of Chemical Engineers), Dr. Margot A Vigeant (Bucknell University), and Dr. Stephen Ward Thiel P.E. (University of Cincinnati)

5. CACHE/ASEE Survey on Computing in Chemical Engineering

Dr. Robert P. Hesketh (Rowan University), Prof. Martha Grover (Georgia Institute of Technology),

#### Tuesday, June 23rd

### T205: Course Design, Course Projects and Student Perceptions in Chemical Engineering

10:20 AM to 10:40 AM EDT

Moderator: Prof. Anthony Butterfield and Dr. LiLu Tian Funkenbusch

1. Can Students Self-Generate Appropriately Targeted Feedback on Their Own Solutions in a Problem-Solving Context

Prof. Carl R. F. Lund (University at Buffalo, SUNY)

2. Putting Course Design Principles to Practice: Creation of an Elective on Vaccines and Immunoengineering

Prof. Joshua A Enszer (University of Delaware) and Prof. Catherine A Fromen (University of Delaware)

Session papers continued on page 8...

#### Tuesday, June 23rd continued...

- 3. Aligning the chemical engineering curriculum to a common problem-solving strategy
  Prof. Nicolas Hudon (Queen's University) and Dr. Louise Meunier P.Eng. (Queen's University)
- **4.** How much does student perception of course attributes impact student motivation?

  Dr. Margot A Vigeant (Bucknell University) and Dr. Amy F. Golightly (Bucknell University)
- 5. By Students for Students: Using Course Projects to Create Learning Materials for Future Classes

Dr. Lucas James Landherr (Northeastern University)

#### T305: Work In Progress: Assessment, Evaluation and Hands-on Activities

11:00 AM to 11:20 AM EDT

Moderators: Dr. David L. Silverstein P.E. and Dr. Sheena M. Reeves

- 1. Work In Progress: The Development And Applied Use of Crash Course Engineering Videos For Formal And Informal Learning
  - Dr. Lucas James Landherr (Northeastern University) and Ms. Nicole Joy Sweeney (Complexly)
- 2. Work-in-Progress: A Delphi Study of Skills and Competencies for the Hydrocarbon Industry
  Dr. Jennifer Cole (Northwestern University), Dr. Allison Godwin (Purdue University at West
  Lafayette), Dr. Joana Marques Melo (Purdue University), and Ms. Jacqueline Ann Rohde
  (Purdue University at West Lafayette)
- 3. Chemical engineering students' emotions towards biology
  - Dr. Justin F Shaffer (Colorado School of Mines), Mr. Jordan Lopez (Colorado School of Mines), and Alexander Luther Ellis (Colorado School of Mines)
- 4. Work-in-Progress: Fostering a Chemical Engineering Mind-set through Hands-on Activities
  Dr. Julianne Vernon (Vanderbilt University), Mr. Matthew Rogers (Vanderbilt University), Mr.
  Benjamin Joseph Saba (Affiliation unknown), and Mr. Yin Huang (Affiliation unknown)

#### **T505: ChED Executive Board Meeting**

2:00 PM to 3:00 PM

#### Wednesday, June 24th

#### W305A: Chemical Engineering in the Sophomore Year

10:40 AM to 11:00 AM EDT

Moderators: Dr. Katie Cadwell and Dr. Justin Shaffer

Student Attitudes When Solving Homework Problems that Reverse Engineer YouTube Videos
 Uchenna Asogwa (The University of Toledo), Prof. Matthew W Liberatore (The University of
 Toledo), Mr. Timothy Ryan Duckett (The University of Toledo), and Dr. Gale A Mentzer (Acumen
 Research and Evaluation, LLC)

Session papers continued on page 9....

#### Wednesday, June 24th continued...

2. Creating and Facilitating Engaging, Rigorous Fully-Online Technical Courses (or just Online Content for Face-to-Face Courses) - an MEB Example

Dr. Tracy Q Gardner (Colorado School of Mines)

3. Evaluating a new second-year introduction to chemical engineering design course using concept mapping

Matheus Oliveira Cassol (University of British Columbia, Vancouver) and Dr. Jonathan Verrett (University of British Columbia, Vancouver)

4. Quantifying success and attempts on auto-graded homework when using an interactive textbook

Prof. Matthew W Liberatore (The University of Toledo), Megan Davidson (The University of Toledo), and Kayla Chapman ()

5. Student performance in an online chemical engineering thermodynamics course on a summer schedule

Dr. David L. Silverstein P.E. (University of Kentucky) and Dr. Sarah A Wilson (University of Kentucky)

#### W305B: Chemical Engineering in the Junior and Senior Year

11:40 AM to 12:00 PM EDT

Moderators: Dr. Cheryl A Bodnar and Dr. Jason White

 Process Control Design and Practice – A New Approach to Teaching Control to Chemical Engineers

Dr. Thomas Andrew Meadowcroft (Rowan University)

2. Using Incident Reporting to Integrate Hazard Analysis and Risk Assessment into the Unit Operations Lab

Dr. Sarah A Wilson (University of Kentucky), Prof. Samira M. Azarin Azarin (University of Minnesota), Dr. Christopher Barr (University of Michigan), Dr. Janie Brennan (Washington University in St. Louis), Prof. Tracy L. Carter (Northeastern University), and Amy J Karlsson (University of Maryland)

3. Exploring Student Decision Making Trends in Process Safety Dilemmas using the Engineering Process Safety Research Instrument

Jeffrey Stransky (Rowan University), Landon Bassett (University of Connecticut), Dr. Daniel D. Anastasio (Rose-Hulman Institute of Technology), Dr. Matthew Cooper (North Carolina State University), Dr. Daniel D. Burkey (University of Connecticut), and Dr. Cheryl A Bodnar (Rowan University)

4. Chemical Engineering Senior Design at Colorado School of Mines: Recent Innovations & Achievements

Prof. Michael David Mau Barankin (Colorado School of Mines) and Prof. Kevin J Cash (Colorado School of Mines)

Session papers continued on page 10...

#### Wednesday, June 24th continued...

#### 5. Development of Learning Modules for Process Plant Operation

Dr. Richard Turton P.E. (West Virginia University), Dr. Fernando V. Lima (West Virginia University), and Mr. Brent A. Bishop (West Virginia University)

#### Thursday, June 25th

#### **ChED Business Meeting**

4:00 PM to 5:00 PM EDT

#### Friday, June 26th

#### F205A: Work In Progress: Hands on Activities

10:00 AM to 10:20 AM EDT

Moderators: Prof. Michael David Mau Barankin and Dr. Erin Jablonski

### 1. Faculty feedback on hub-based approach to national dissemination of low-cost desktop learning modules

Katelyn Dahlke (Washington State University), Prof. Bernard J. Van Wie (Washington State University), Jacqueline Burgher Gartner (Campbell University), Dr. Olusola Adesope (Washington State University), Dr. Prashanta Dutta (Washington State University), and David B. Thiessen (Washington State University)

2. Work in Progress: Kinesthetic Learning of Network Mechanics using Force Feedback Technology

Dr. Ilhem F. Hakem (Carnegie Mellon University), Mr. Richard Tang (Carnegie Mellon University), and Dr. Michael R. Bockstaller (Carnegie Mellon University)

3. Design Philosophy and System Integrity for Propagation of Hands-on Desktop Learning Modules for Fluid Mechanics and Heat Transfer

Negar Beheshti Pour (University of California - Berkeley), David B. Thiessen (Washington State University), Prof. Bernard J. Van Wie (Washington State University), Kitana Kaiphanliam (Washington State University), Aminul Islam Khan P.E. (Washington State University), Dr. Prashanta Dutta (Washington State University), Mrs. Olivia Reynolds (Washington State University), Katelyn Dahlke (University of Wisconsin - Madison), Prof. Olusola Adesope (Washington State University), Olufunso Oje (Washington State University), and Jacqueline Burgher Gartner (Campbell University)

4. Work-in-Progress: Hands-On Learning Devices for Exposure to Biomedical Applications Within Chemical Engineering

Kitana Kaiphanliam (Washington State University), Mrs. Olivia Reynolds (Washington State University), David B. Thiessen (Washington State University), Dr. Olusola Adesope (Washington State University), and Prof. Bernard J. Van Wie (Washington State University)

#### Friday, June 26th continued...

F305: Perceptions, Reflections, Collaborations, and Student Support in Chemical Engineering

11:00 AM to 11:20 AM EDT

Moderators: Dr. Marina Miletic and Dr. Jennifer Pascal

1. Pre and Post Tenure: Perceptions of Requirements and Impediments for Chemical Engineering Faculty

Dr. Elif Miskioglu (Bucknell University), Dr. Nicholas Tymvios (Bucknell University), Dr. Eliana Christou (University of North Carolina at Charlotte), and Dr. Benjamin B Wheatley (Bucknell University)

2. Student Confidence and Metacognitive Reflection with Correlations to Exam Performance in a FE Review Course in Chemical Engineering

Sheima J. Khatib (Texas Tech University), Dr. Roman Taraban (Texas Tech University), and William D Lawson P.E., Ph.D. (Texas Tech University)

3. Collaborative project-based learning approach to the enculturation of senior engineering students into professional engineer practice of teamwork

Ms. Yu Xia (Pennsylvania State University), Dr. Stephanie Cutler (Pennsylvania State University), and Prof. Dawn McFadden (Pennsylvania State University)

4. From Assessment to Research: Evolution of the Study of a Two-Day Intervention for ChemE Sophomores

Dr. Bradley Cicciarelli (Louisiana Tech University), Eric A. Sherer (Louisiana Tech University), Baker A. Martin (Clemson University), and Dr. Marisa K. Orr (Clemson University)

5. Supporting the Mental Health and Wellness of Chemical Engineering Students at the Department and College Levels

Dr. Andrew Maxson (The Ohio State University) and Dr. David L. Tomasko (The Ohio State University)

ChED Open Mic Session: Friday, June 26th 4:00 to 5:00 PM EDT

Unwind at the end of the conference with the Open Mic Session, reimagined for our new format – stay tuned for more details!

See you online in June!

#### **Virtual Communities of Practice**

The Chemical Engineering Education community has come together to run 5 virtual communities of practice (VCPs) during the past few months. While some groups are on hiatus, other groups are still meeting regularly. The themes of the VCPs are: 1. Material and Energy Balance + Thermodynamics, 2. Transport Phenomena and Separations, 3. engineering + Control, 4. Design, and 5. Lab. If you would like more information, please contact either Matt Liberatore (matthew.liberatore@utoledo.edu) or Daniel Lepek (Daniel.Lepek@cooper.edu). AIChE Education Division officers.

#### **Call for Participation – Occupation Experts**

The O\*NET Data Collection Program, sponsored by the U.S. Department of Labor, is seeking the input of expert Chemical Engineers. As the nation's most comprehensive source of occupational data, O\*NET is a free resource for millions of job seekers, employers, veterans, educators, and students at <a href="https://www.onetonline.org">www.onetonline.org</a>. You have the opportunity to participate in this important initiative and your participation will help ensure that the complexities of your profession are described accurately in the O\*NET database for the American public. O\*NET Description of Chemical Engineers: Design chemical plant equipment and devise processes for manufacturing chemicals and products, such as gasoline, synthetic rubber, plastics, detergents, cement, paper, and pulp, by applying principles and technology of chemistry, physics, and engineering.

<u>Criteria</u>: 1) You have at least 5 years of experience with the occupation. This time can include supervising, teaching, or training, if you have at least one year working as a Chemical Engineer during your career. 2) You are currently active in the occupation (practicing, supervising, teaching and/or training) and based in the U.S.

If you meet these criteria and are interested in participating, please contact Jim Rose at RTI International, the O\*NET data collection contractor (<a href="mailto:irose@onet.rti.org">irose@onet.rti.org</a> or 919-926-6584). Please provide the following: Name, ASEE, Address with city and state, Daytime phone number, Email address

Process and Participation Incentive: A random sample of experts responding to this request will be invited to complete a set of questionnaires (paper or online versions available). Experts who are selected and agree to participate will receive \$40.00 in cash and a certificate of appreciation from the U.S. Department of Labor. We encourage you to consider helping to keep information about your profession accurate and current for the benefit of our colleagues and the nation.

#### Call for Participation: Seeking Chemical Engineers with Substantial Industry Experience (any sector)

We are seeking experts in chemical engineering design to validate a new test for measuring the chemical engineering problem-solving skills of undergraduates. If you are a chemical engineer with substantial experience in any sector of the industry, including being a professor of practice, we would greatly appreciate your help. It will take you about 45 minutes to complete the test and can be completed <a href="here">here</a>. Your participation will allow us to characterize and measure expertise in chemical engineering and will provide ChemE departments with an evidence-based way to design the undergraduate curriculum to produce better engineers in the future.

### University of Missouri College of Engineering TigerView 2020 Program

The University of Missiouri College of Engineering's TigerView Program is designed to increase the number of underrepresented students who actively pursue a graduate degree. The program spans over a 4-day period and is currently slated to be held on Mizzou's campus in October. Information regarding the program is attached. I encourage you to share this information with any students, or anyone who knows of students, interested in pursuing a graduate degree. Priority deadline for applications is July 24<sup>th</sup> and the final deadline is July 31<sup>st</sup>. All questions regarding the program should be directed to Dr. Raquel Arouca (aroucar@missouri.edu).

### Call for Papers: Education for Chemical Engineers Special Issue

As part of the forthcoming *Education for Chemical Engineers* special issue on 'Digitalisation in Chemical Engineering Education and Training' (https://www.journals.elsevier.com/education-for-chemical-engineers/call-for-papers/digitalisation-in-chemical-engineering-education-and-traini) we would like to encourage you to consider submitting an article to this special issue. For this special issue we are particularly interested in 'Tools for Sharing' articles with an emphasis on tools for virtual delivery and assessment that have been adapted in light of the COVID-19 pandemic.

Photo Credits: Spring at the White House: Joyce Boghosian, ASEE Conference Logo: ASEE, Summer School Photo: Lisa Bullard