

# MATTHEW W. LIBERATORE

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## **PROFESSIONAL EXPERIENCE**

2017- University of Toledo, Professor of Chemical Engineering (tenured)  
2015- Lead Author, zyBooks – a Wiley brand  
2018 University of Canterbury, Erskine Fellow  
2015-2017 University of Toledo, Associate Professor of Chemical Engineering (tenured)  
2014-2015 Read Swipe Solve LLC, Founder and Author  
2011-2015 Colorado School of Mines, Associate Professor of Chemical Engineering (tenured)  
2005-2011 Colorado School of Mines, Assistant Professor of Chemical Engineering  
2004-2005 University of Delaware, Postdoctoral Fellow with N.J. Wagner and E.W. Kaler  
1999-2003 University of Illinois at Urbana-Champaign, Research Assistant with A.J. McHugh and T.J. Hanratty  
1997-1999 Argonne National Laboratory, Engineering Assistant and Engineering Intern

## **EDUCATION**

2003 Ph.D., Chemical Engineering, University of Illinois at Urbana-Champaign  
2001 M.S., Chemical Engineering, University of Illinois at Urbana-Champaign  
1999 B.S., Chemical Engineering, University of Illinois at Chicago (with honors)

## **HONORS**

University of Toledo College of Engineering Excellence in Teaching Award 2019  
Alumni Teaching Award from the Colorado School of Mines 2014-2015  
Innovation in Chemical Engineering Education Award from the AIChE Education Division 2014  
Rudolf Hering Medal from ASCE for the outstanding paper in the area of environmental engineering (with J. Silva and J. McCray) 2014  
Raymond W. Fahien Award from the ASEE Chemical Engineering Division for contributions to chemical engineering education 2013  
Professor of the Year, Chemical and Biological Engineering Department as voted by graduating seniors 2011-2012  
Alfred E. Jenni Faculty Fellowship for institution-wide contributions in teaching effectiveness and educational scholarship 2010-2011  
Mentoring and Travel Grant for New Attendees, ASEE Chemical Engineering Division 2011

### Honors for Research Advisees

Paper Award, 2 <sup>nd</sup> Place presentation (Cristin Reno), AIChE North Central Regional Meeting	2019
Poster Award, 2 <sup>nd</sup> Place Material Science and Engineering (Lisa Young), AIChE Annual Meeting Undergraduate Research Poster Session	2018
Outstanding Student Poster Award (Ye Liu) at the Gordon Research Conference on Fuel Cells	2014
Best Overall Presentation Award (Tara Pandey) at the Conference on Earth and Energy	2014
Best Paper, Undergraduate Research Paper Competition (Marc Donnelly) at the AIChE Rocky Mountain Regional Meeting	2013
Best Poster Award, Chemical & Biological Engineering (Melissa Vandiver) at the Conference on Earth and Energy Research	2013
Poster Award, 2 <sup>nd</sup> Place Student Competition (Melissa Vandiver), 222 <sup>nd</sup> Electrochemical Society Meeting	2012
Best Poster Award, Chemical & Biological Engineering (Melissa Vandiver) at the Conference on Earth and Energy Research	2012
Poster Award, 2 <sup>nd</sup> Place Student Competition (Melissa Vandiver), 220 <sup>th</sup> Electrochemical Society Meeting	2011
Poster Award, 2 <sup>nd</sup> Place student competition (Eric B. Webb), Society of Rheology 82 <sup>st</sup> Annual Meeting	2010
Poster Award, 2 <sup>nd</sup> Place student competition (Patrick Rensing), Society of Rheology 81 <sup>st</sup> Annual Meeting	2009
Best Poster Award (Nicholas Wyatt), CSM Graduate Research Fair	2008

### **TEACHING EXPERIENCE AND EDUCATIONAL DEVELOPMENT**

#### Courses Taught

Graduate Thermodynamics	Fall 2005, Fall 2006, Fall 2007
Heat Transfer	Spring 2007, Spring 2008
Introduction to Engineering Thermodynamics	Spring 2008, Fall 2008, Fall 2009, Fall 2013, Fall 2014, Summer 2018
Unit Operations Laboratory	Summer 2008
Material and Energy Balances	Spring 2009, Spring 2010, Spring 2011, Spring 2012, Spring 2014, Spring 2015, Spring 2016, Spring 2017, Spring 2018, Spring 2019
Transport Phenomena	Fall 2011
Polymer and Complex Fluids Colloquium	Spring 2011, Fall 2011, Spring 2012, Fall 2013, Spring 2014
Scattering Methods (online/in person hybrid)	Fall 2011
Scattering in Soft Materials (online/in person hybrid)	Fall 2013
Graduate Transport Phenomena (Fluid mechanics)	Fall 2015, Fall 2016, Fall 2017, Fall 2018

#### Educational Development

Author, interactive textbooks – see Books section below	2013-
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Participant, Center for Chemical Process Safety Faculty Workshop at BASF Wyandotte, MI	July 2019
Workshop Instructor, University of New Mexico Department of Chemical and Biological Engineering titled: Tips, tools, and technology for teaching large classes	2018
Workshop Instructor, ASEE Summer School for Chemical Engineering Faculty	2017
Workshop co-instructed with Daniel Lepek and titled “Digital Tools Inside and Outside the Classroom for Enhanced Student Learning” attended by 60 faculty	
Workshop Instructor, ASEE Summer School for Chemical Engineering Faculty	2017
Workshop co-instructed with Daniel Burkey and Reginald Rogers and titled “Scale Up: Tools and Tips for Teaching a Large Class” attended by 53 faculty	
Workshop Instructor, ASEE Summer School for Chemical Engineering Faculty	2017
Workshop co-instructed with Margot Vigeant and Patrick Abulencia and titled “Engaging students in the 21st Century: Using YouTube to develop course content” attended by 33 faculty	
Author, online homework for a course in Thermodynamics on Sapling Learning	2014
Author, Knovel University Challenge	2013
Participant, ASEE Virtual Community of Practice for Material and Energy Balances course	2013-2014
Workshop Instructor, ASEE Summer School for Chemical Engineering Faculty	2012
Workshop titled “Engaging students in the 21st Century: Using YouTube to develop course content” attended by 35 faculty	
Participant, ASEE Advanced National Effective Teaching Institute	2012
Instructor, K12 Summer Teacher Workshop (bioenergy)	2010, 2012-2015
Invited participant, National Academy of Engineering Frontiers of Engineering Education	2011
Instructor, Outreach to local middle and high school student using hands on projects	2011-2015
Participant, NSF workshop on biochemical engineering content in heat and mass transfer courses	2009
Participant, ASEE Summer School for Chemical Engineering Faculty	2007

## **RESEARCH AND SCHOLARSHIP**

### Books

M.W. Liberatore, *Material and Energy Balances ZyBook*, 2019. Electronic, interactive textbook. Available at [zybooks.com](http://zybooks.com).

M.W. Liberatore, *Spreadsheets Essentials ZyBook*, 2019. Electronic, interactive textbook. Available at [zybooks.com](http://zybooks.com).

3 Patents to date  
83 Articles (peer reviewed) to date  
18 Conference Proceedings  
60 Invited Presentations  
143 Presentations

### **Research Supervision**

Post-doctoral – 5 former

Doctoral – 1 current, 9 completed

Masters – 3 current, 5 completed

Undergraduate – 55 students. Includes 24 women and 10 from underrepresented groups or U.S. military veterans; 13 earned co-author peer-reviewed journal publications

K-12 Science/Math Teachers – 4 teachers doing summer research to date

Visiting Researchers – 1 to date

### Research Funding

Over \$4.7M total awards as PI, over \$1M co-PI share, over \$12M total awards as PI or co-PI. Sources include NSF, DOE, Army, ACS-PRF, and industry. Single PI grant unless noted.

### **SERVICE ACTIVITIES**

#### Professional

Ad hoc reviewer for ACS books, ACS Applied Polymer Materials, ACS Combinatorial Science, Advances in Engineering Education, AIChE Journal, Applied Rheology, ASEE Conference Proceedings, Bioresource Technology, Biorheology, Biotechnology and Bioengineering, Biotechnology for Biofuels, California Baptist University Curriculum Reviewer, Chemical Engineering Education, Chemical Engineering Journal, Chemical Engineering Science, Colloids and Surfaces B, Education for Chemical Engineers, Energy and Fuels, Food hydrocolloids, Fuel, Fuel Processing Technology, Indian Institute of Technology Gandhinagar, Industrial and Engineering Chemistry Research, International Journal of Biological Macromolecules, International Journal of Heat and Mass Transfer, International Journal of Hydrogen Energy, International Journal of Mechanical Engineering Education, International Journal of Multiphase Flow, International Journal of Physical Sciences, International Journal of Refrigeration, Isreali Science Foundation, Journal of Applied Mechanics, Journal of Applied Polymer Science, Journal of Chemical Education, Journal of Chemical & Engineering Data, Journal of Colloid and Interface Science, Journal of Food Process Engineering, Journal of Membrane Science, Journal of Non-Newtonian Fluid Mechanics, Journal of Pharmaceutical Innovation, Journal of Physical Chemistry, Journal of Rheology, Journal of Visualized Experiments, Korea-Australia Rheology Journal, Langmuir, Macromolecules, Materials and Design, Polymer, Polymer Bulletin, Polymer International, Proceedings of the American Society of Engineering Education Annual Conference, Proceedings of the Symposium on Biotechnology for Fuels and Chemicals, Purdue University Center for Instructional Excellence, Rheologica Acta, Scientific Reports, Soft Matter, Wiley Books

Proposal and panel reviewer for ACS-PRF, DOE Office of Science Graduate Fellowships, Kansas Technology Enterprise Corporation, NIST Neutron Scattering, NSF, Research Foundation of the City University of New York

Invited participant, NIST Center for Neutron Research Expansion Workshop	2006
Poster session chair, ACS Colloid and Surface Science Symposium	2006
Poster session chair and student poster contest organizer, Society of Rheology Annual Meeting	2006
Exhibitor for Colorado Center for Biorefining and Biofuels, World Congress on Industrial Biotechnology and Bioprocessing	2007
Poster session chair, 29th Symposium on Biotechnology for Fuels and Chemicals	2007
General Papers session chair, ACS Colloid and Surface Science Symposium	2007
Blends, Emulsions and Multiphase Flows session chair, Society of Rheology Annual Meeting	2007
Suspensions and Emulsions presiding chair, The XVth International Congress on Rheology	2008
Personal Care Products discussion leader and invited panelist, Industrial-Academic Workshop: Evolving Multiphase Flows	2008
Industrial Rheology and Complex Systems session chair, Suspensions and Colloids presiding chair, Judge for Postdoctoral Scholar Poster Competition, Society of Rheology Annual Meeting	2009
Colloid and Surface Chemistry in Energy Systems session chair, ACS Colloid and Surface Science Symposium	2010
Self-assembly, Associative and Gel-like Systems session chair, Society of Rheology Annual Meeting	2010
Suspensions, Colloids and Emulsions session chair, Society of Rheology Annual Meeting	2011
Local Arrangements Committee Chair, Society of Rheology Annual Meeting in Denver, CO from October 8 to 12, 2017 Hosted over 400 participants for over 100 individual events and sessions and managed over \$200,000 budget to a surplus	2012-2017
2 <sup>nd</sup> Vice Chair, AIChE Education Division Assistant program chair for over 20 sessions at Annual Meeting	2014-2015
1 <sup>st</sup> Vice Chair, Chair, AIChE Education Division Program chair for over 20 sessions at Annual Meeting - Led programming meeting, session and workshop topic selection, and session chair recruiting Initiated Education Division webinar series in January 2017 – 5 webinars hosted in 2017	2016-2017
Chair, AIChE Education Division Lead monthly meetings of the nine-member Division board Charged six committees of volunteers to continue and expand Division Successfully initiated sponsor program for Division's awards (two sponsors in 2018, 2019)	2018-2019
Member, AIChE Education Division Awards Committee	2015-2017
Mentor, AIChE Future Faculty Program	2013-
Member, Publications Board for <i>Chemical Engineering Education</i>	2014-2016
Chair, Ad hoc committee on web pages for the journal	2015-2016

Education Division poster session chair and Best practices of REU sites session chair, AIChE Annual Meeting	2014, 2015
Poster session judge, Undergraduate student poster session, AIChE Annual Meeting (multiple years)	2014-
Organizing committee and Session Chair, Fluid Dynamics and Transport Phenomena, AIChE Midwest Regional Meeting	2017
Judge, UT-WSU Chemical Engineering Graduate Symposium	2017-
Invited participant, LinkedIn Learning Summit Chicago	2017
Session moderator, Open Forum in Chemical Engineering Education session at ASEE Annual Meeting	2017
Session moderator, Material and energy balances breakout at ASEE Chemical Engineering Summer School	2017
Poster session judge, ASEE Chemical Engineering Summer School	2017
Co-organizer, ASEE Chemical Engineering Summer School Expo – invited companies to exhibit and present during Industry day	2017
Education Division poster session co-chair, AIChE Annual Meeting	2016, 2017
Judge (Safety), ChemEcar competition, AIChE Regional Meeting, Purdue University	2018
Session Chair, Education Division Award Winners: Service, Innovation, and Research (Invited Talks), AIChE Annual Meeting	2018
Advisory board member, Chemical Engineering program at United States Military Academy, West Point	2019

### University

Colloquium Organizer	2005-2007
Member, Assistant Professor Search Committee	2007-2008
Poster Judge, Graduate Research Fair/CEER Conference	2007-2015
Member, Graduate Affairs Committee	2007-2010
Faculty Advisor/Chief Advisor, Tau Beta Pi Colorado Alpha Chapter Awarded grant (\$750) for K12 project 2009-2010	2007-2015
Department Representative, Undergraduate Council	2008-2012
Member, Department Head Search Committee	2009-2010
Member, Executive Committee in Department of Chemical and Biological Engineering	2010-2012, 2013-2015
Chair, Undergraduate Affairs Committee	2010-2012, 2013-2015
Chair, Teaching Associate Professor Search Committee	2011-2012
Faculty Advisor, AIChE Student Chapter AIChE Regional Student Paper Competition (2012: 1 <sup>st</sup> place, 2013: 1 <sup>st</sup> and 3 <sup>rd</sup> place, 2014: 2 <sup>nd</sup> place, 2015: 1 <sup>st</sup> place)	2012-2015
Member, University Awards Committee	2012, 2015
Member, Faculty Oversight Committee for Sports and Athletics	2011-2012
Faculty Advisor, Mines Catholic Campus Ministry	2013-2015
Member, Conflict of Interest Committee	2013-2015
Member, Department Awards Committee	2013-2015
Member, Assistant Professor Search Committee	2013-2014

Faculty sponsor, University Innovation Fellow (Corey Brugh)	2013-2015
Chair, Teaching Assistant Professor (Biology) Search Committee	2014
Member, University Innovation Team (Pathways to Innovation Program)	2014-2015
Member, Coors Chair Professor Search Committee	2014-2015
Faculty Advisor, AIChE Student Chapter	2017-
Won Regional ChemEcar competition 2018; Hosted Regional Meeting in 2019 with 400 participants and \$40,000 budget; Won 1 <sup>st</sup> and 2 <sup>nd</sup> place in regional paper competition 2019;	
Chair, Lecturer Search Committee	2017-2018
Member, College of Engineering Strategic Planning Working Group on Pedagogical Scholarship	2017-2018
Member, Department Personnel Committee	2017-
Seminar organizer, hosted 13 speakers related to safety, chemical engineering research, and engineering education	Spring 2018
Chair, Faculty Executive Committee College of Engineering	2018-2019
Initiated faculty site on learning management system, altered faculty meeting time and format to allow more faculty to attend and participate	