

# Dr. Ryan Anderson – Curriculum Vitae

## Contact Information

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## Current Position

Assistant Professor  
Department of Chemical and Biological Engineering  
Montana State University

## Education

Bucknell University	B.S. Chemical Engineering	2007
Bucknell University	B.S. History	2007
University of British Columbia	Ph.D. Chemical and Biological Eng.	2012
City College of New York	Postdoc. Chemical/Mechanical Eng.	2012-13

## Experience

2013 -	Assistant Professor, Department of Chemical and Biological Engineering, Montana State University
2012-2013	Postdoctoral Research Associate, Departments of Chemical Engineering and Mechanical Engineering, City College of New York
2009-2012	Teaching Assistant in Chemical and Biological Engineering, University of British Columbia
2007-2012	Research Assistant in Chemical and Biological Engineering, University of British Columbia
Summer 2006	Undergraduate Researcher, Universität Karlsruhe, Germany
Summer 2004-Fall 2005	Undergraduate Researcher, Bucknell University

## **1 Research**

### **1.1 Journal articles, conference articles, and conference presentations**

Undergraduate students are noted with a \* while graduate students are noted with a <sup>+</sup>.

1. M.E. Skuntz<sup>+</sup>, D. Perera<sup>+</sup>, J.E. Maneval, J.D. Seymour, R. Anderson, Melt-front propagation and velocity profiles in packed beds of phase-change materials measured by magnetic resonance imaging, Chemical Engineering Science 190 (2018) 164-172
2. L. Battrell<sup>+</sup>, N. Zhu, L. Zhang, R. Anderson, Transient, spatially resolved de-saturation of gas diffusion layers measured via synchrotron visualization, I. J. Hydrogen Energy 43 (2018) 11234-11243.

3. M.M.S. Al-Azawii<sup>+</sup>, C. Theade\*, M. Danczyk\*, E. Johnson, R. Anderson, Experimental study on the cyclic behavior of thermal energy storage in an air-alumina packed bed, *Journal of Energy Storage* 18C (2018) 239-249.
4. P. Rahimian<sup>+</sup>, L. Battrell<sup>+</sup>, R. Anderson, E. Johnson, N. Zhu, L. Zhang, Investigation of time dependent water droplet dynamics on porous fuel cell material via synchrotron based x-ray imaging technique, *Experimental Thermal and Fluid Science* 97 (2018) 237-245.
5. E. Johnson, L. Bates\*, A. Dower<sup>+</sup>, P.C. Bueno, R. Anderson, Thermal energy storage with supercritical carbon dioxide in a packed bed of alumina: modeling charge-discharge cycles, *The Journal of Supercritical Fluids* 137 (2018) 57-65.
6. L. Battrell<sup>+</sup>, A. Trunkle\*, E. Eggleton\*, L. Zhang, R. Anderson, Quantifying cathode water transport via anode relative humidity measurements in a polymer electrolyte membrane fuel cell, *Energies* 10(8) (2017), 1222.
7. F. I. Valentin<sup>+</sup>, R. Anderson, M. Kawaji, Experimental investigation of convection heat transfer in high pressure and high temperature gas flows, *Journal of Heat Transfer* 139 (2017) 091704-1.
8. P. Rahimian<sup>+</sup>, R. Anderson, L. Zhang, Predictions of flow regimes in proton exchange membrane fuel cells: An analytical approach, *I. J. Hydrogen Energy* 42 (2017) 4679-4689.
9. F. I. Valentin<sup>+</sup>, N. Artoun, R. Anderson, M. Kawaji, D.M. McEligot, Study of convection heat transfer in a very high temperature reactor flow channel: numerical and experimental results, *Nuclear Technology* 196 (2016) 661-673.
10. R. Anderson, L. Bates\*, E. Johnson, J.F. Morris, Packed bed thermal energy storage: A simplified experimentally validated model, *J. Energy Storage* 4 (2015) 14-23.
11. R. Anderson, E. Eggleton\*, L. Zhang, Development of two-phase flow regime specific pressure drop models for proton exchange membrane fuel cells, *I. J. Hydrogen Energy* 40 (2015) 1173–1185.
12. R. Anderson, S. Shiri<sup>+</sup>, H. Bindra, J. Morris, Experimental results and modeling of energy storage and recovery in a packed bed of alumina particles, *Applied Energy* 119 (2014) 521-529.
13. Y. Ding, R. Anderson, L. Zhang, X. Bi, D.P. Wilkinson, Simulations of two-phase flow distribution in communicating parallel channels for a PEM fuel cell, *Int. J. Multiphase Flow* 52 (2013) 35-45.
14. R. Anderson, M. Blanco, D.P. Wilkinson, X. Bi, Anode water removal and cathode gas diffusion layer flooding in a proton exchange membrane fuel cell, *I. J. Hydrogen Energy* 37 (2012) 16093–16103.
15. R. Anderson, D.P. Wilkinson, X. Bi, L. Zhang, Two-phase flow pressure drop hysteresis in an operating proton exchange membrane fuel cell, *J. Power Sources* 196 (2011) 8031-8040.
16. L. Zhang, X.T. Bi, D.P. Wilkinson, R. Anderson, J. Stumper, H. Wang, Gas-liquid two-phase flow behaviour in minichannels bounded with a permeable wall, *Chem. Eng. Sci.* 66 (2011) 3377-3385.

17. R. Anderson, L. Zhang, Y. Ding, M. Blanco, X. Bi, D.P. Wilkinson, A critical review of two-phase flow in gas flow channels of proton exchange membrane fuel cells, *J. Power Sources* 195 (2010) 4531-4553.
18. R. Anderson, D.P. Wilkinson, X. Bi, L. Zhang, Two-phase flow pressure drop hysteresis in parallel channels of a proton exchange membrane fuel cell, *J. Power Sources* 195 (2010) 4168-4176.

### Conference Papers with Peer Review

*Presenting author italicized:*

1. *L. Battrell*<sup>+</sup>, A. Trunkle\*, E. Eggleton\*, L. Zhang, R. Anderson, Investigation of water transport within a proton exchange membrane fuel cell by diffusion layer saturation analysis, Proceedings of the ASME 2016 14<sup>th</sup> International Conference on Fuel Cell Science, Engineering and Technology, FUELCELL2016-59408.
2. *Recipient of a best paper award: F.I. Valentín*<sup>+</sup>, N. Artoun, R. Anderson, M. Kawaji, Study of abnormal heat transfer during forced and natural convection scenarios in a prismatic core of a VHTR: Numerical and experimental results, 16<sup>th</sup> International Topical Meeting on Nuclear Reactor Thermal Hydraulics (NURETH-16), August 30-September 4, 2015, Chicago, Illinois, USA.
3. *R. Anderson*, L. Zhang, An updated two-phase flow regime map in active PEM fuel cells based on a force balance approach, 13<sup>th</sup> International Conference on Nanochannels, Microchannels and Minichannels (ICNMM), July 2015, InterPACKICNMM2015-48527.
4. *P. Bueno*, L. Bates\*, R. Anderson, H. Bindra, Thermal energy storage for the supercritical CO<sub>2</sub> Brayton cycle, ASME Turbo Expo 2015: Turbine Technical Conference and Exposition, June 2015, GT2015-44054.
5. *R. Anderson*, D.P. Wilkinson, L. Zhang, An analysis of two-phase flow pressure drop in operating proton exchange membrane fuel cell channels with the Lockhart-Martinelli approach, 12<sup>th</sup> International Conference on Nanochannels, Microchannels and Minichannels (ICNMM), August 2014, FEDSM2014-21288.
6. R. Anderson, K. Togashi, *M. Kawaji*, R. Ramnanan-Singh, Forced convection heat transfer of a phase change material (PCM) nanoemulsion, ASME 2013 Summer Heat Transfer Conference, July 2013, HT2013-17810.
7. *F.I. Valentín*<sup>+</sup>, R. Anderson, M. Kawaji, Study of two particular cases of abnormal heat transfer phenomena occurring in a VHTR reactor core, American Nuclear Society Winter Meeting, 2013.
8. *R. Anderson*, M. Blanco, D.P. Wilkinson, X. Bi, The use of the anode water removal method to understand cathode gas diffusion layer flooding, ASME 10<sup>th</sup> Fuel Cell Science, Engineering and Technology Conference, July 2012, ESFuelCell2012-91421.
9. *R. Anderson*, D.P. Wilkinson, X. Bi, L. Zhang, Two-phase flow pressure drop hysteresis under typical operating conditions for a proton exchange membrane fuel cell, *Electrochemical Society Trans.* 28 (2010) 127-137.

## Conference Presentations

*Presenting author italicized:*

1. [Poster] *L. Battrell*<sup>+</sup>, M. English\*, P. Milner\*, L. Zhang, R. Anderson, Experimental investigation and synchrotron visualization of water transport of thin porous media in polymer electrolyte membrane fuel cells, InterPore- 10<sup>th</sup> International Conference on Porous Media & Annual Meeting, May 2018.
2. *M.E. Skuntz*<sup>+</sup>, D. Perera<sup>+</sup>, J.E. Maneval, J.D. Seymour, R. Anderson, Flow and temperature front correlation in phase change porous media measured by MRI, InterPore- 10<sup>th</sup> International Conference on Porous Media & Annual Meeting, May 2018.
3. *L. Battrell*<sup>+</sup>, E. Eggleton\*, M. English\*, L. Zhang, and *R. Anderson*, “Experimental measurements of water transport in proton exchange membrane fuel cells via in-situ performance testing and ex-situ synchrotron x-ray radiography”, 2017 AIChE Annual Meeting, October 2017.
4. *M. Skuntz*<sup>+</sup>, J.E. Maneval, D. Perera<sup>+</sup>, J.D. Seymour, *R. Anderson*, “Experimental temperature and fluid flow measurements in packed beds with magnetic resonance imaging”, 2017 AIChE Annual Meeting, October 2017.
5. *J.D. Seymour*, J.E. Maneval, M. E. Skuntz<sup>+</sup>, D. Perera<sup>+</sup>, R. Anderson, “MRI measurement and numerical simulation of coupled fluid flow and heat transfer in phase change material (PCM) porous media”, InterPore- 9<sup>th</sup> International Conference on Porous Media & Annual Meeting, May 2017.
6. [Poster] *E. Eggleton*\*, *L. Battrell*<sup>+</sup>, R. Anderson, “Diffusion layer saturation analysis of PEM fuel cells”, 31<sup>st</sup> Annual National Conference on Undergraduate Research (NCUR), April 2017.
7. *P. Rahimian*<sup>+</sup>, *L. Battrell*<sup>+</sup>, R. Anderson, N. Zhu, L. Zhang, “Using X-ray radiographic imaging technique for investigation of water droplet dynamics in proton exchange membrane (PEM) fuel cells”, CSCHE 2016 66<sup>th</sup> Canadian Chemical Engineering Conference, October 2016.
8. *R. Anderson*, L. Bates\*, “Modeling thermal energy storage utilizing air as heat transfer fluid and alumina as storage material”, AIChE 2015 Spring Meeting and 11<sup>th</sup> Global Congress on Process Safety, April 2015, Paper # 400964.
9. *R. Anderson*, L. Zhang, “Advances in the Lockhart-Martinelli approach to predict pressure drop in PEM fuel cells”, AIChE 2015 Spring Meeting and 11<sup>th</sup> Global Congress on Process Safety, April 2015, Paper # 400958.

## Additional Presentations by Anderson

1. Energy Research Institute Day, “Energy research in porous media”, March 20, 2018, Montana State University.
2. Invited Speaker: “Transport phenomena topics in fuel cells and energy storage”, June 25, 2015, University of Saskatchewan.
3. Energy Research Institute Day, “Transport phenomena in clean energy systems: fuel cells and energy storage”, May 28, 2015, Montana State University.

4. College of Engineering Seminar, "Heat transfer and fluid flow in clean energy technologies", March 20, 2015, Montana State University.
5. Applied Math Seminar, "Finding common ground in energy topics with a focus on transport phenomena: A research overview", January 30, 2014, Montana State University.

### **MSU Research Celebration Poster Presentations**

*Students funded by the Undergraduate Scholars Program in the Fall/Spring semesters present a poster at the MSU Research Celebration Day during the Spring semester.*

1. Prasad Milner, Three-Dimensional Computational Modeling of Water Vapor in PEM Fuel Cells, 2018.
2. Erica Eggleton, Diffusion Layer Saturation Analysis of PEM Fuel Cells, 2017.
3. Joseph Watkins, Two-Dimensional Modeling of Water Vapor Transport in PEM Fuel Cells, 2017.
4. Megan Danczyk, Experimental Results and Modeling of Thermal Energy Storage System, 2017.
5. Liana Bates, Thermal Energy Storage using Star CCM+, 2015.
6. Aubree Trunkle, Water Management within a Fuel Cell, 2015.
7. Nikita Cardenas, Pore Scale Modeling of Fluid Flow and Heat Transfer Through a Packed Bed, 2015.
8. Spencer Dahl and Tyler Bellville, Heat Transfer Coefficients of Phase Change Materials, 2014.

### **1.2 Research funding and proposal writing**

1. National Science Foundation: "*US-Canada Planning Visit: Investigating Multiphase, Multiscale Transport Phenomena in PEM Fuel Cells with Synchrotron X-Ray Radiography*". Award 1444198, Start date 03/15/15, 12 months, \$29,835.
2. National Science Foundation: "*Local Velocity and Temperature Profiles in Multiphase Systems Measured By Nuclear Magnetic Resonance Imaging*". Award 1511045, Start date 09/01/15, 3 years, \$326,848.
3. National Science Foundation: "*Research Initiation: Effectively Integrating Sustainability within an Engineering Program*", Award 1544174, 01/01/16, 24 months, \$150,000.

### **1.3 Student research productivity and performance**

#### **Graduate Researchers Advised**

1. Matthew Skuntz, PhD, Mechanical Engineering, August 2016 – Present
2. Mohammad Al-Azawii, PhD, Mechanical and Industrial Engineering, Sept. 2014-Present
3. Logan Battrell, PhD, Chemical and Biological Engineering, July 2014-Present

*Completed:*

4. Dinal Perera, MS, Mechanical Engineering, January 2016-December 2017, Completed.
5. Dongyu Han, M Eng Course-Based, CHBE, Jan. 2017-December 2017, Completed.

6. Farzin Mashali, MS, CHBE, Sept. 2014-Dec. 2014.
7. Mehmet Kiris, M Eng Course-Based, CHBE, Aug. 2013- Nov. 2013, Completed.

### **Undergraduate Researchers Advised**

1. Brenden Pelkie, CHBE, INBRE Scholar, Fall 2018 - Present
2. David Baker, CHBE, Presidential Emerging Scholar, Summer 2018
3. Carter Theade, CHBE, Summer 2017-May 2018
4. Prasaad Milner, CHBE, Fall 2017-May 2018
5. Megan Danczyk, CHBE, Fall 2016-Spring 2017
6. Megan Miller, CHBE, Summer 2016-Fall 2016
7. Joe Watkins, CHBE, Spring 2016
8. Erica Eggleton, CHBE, Summer 2014, Fall 2015-Spring 2017
9. Liana Bates, CHBE, Summer 2014-Dec. 2015
10. Aubree Trunkle, CHBE, Summer 2015-May 2015
11. Whitey Morris, Pre-Engineering, BRIDGES summer program 2015
12. Nikita Cardenas, CHBE, Jan. 2015-May 2015
13. Bryan Smith, CHBE, May 2014-Aug. 2014
14. Majed Madani, CHBE, Jan. 2014 - May 2014
15. Tyler Bellville, CHBE, Dec. 2013-Dec. 2014
16. Spencer Dahl, CHBE, Sept. 2013-May 2014

### **Independent Study Research Projects**

*ECHM 290R: Directed undergraduate research/creative activity*

1. Megan English, CHBE, Fall 2016, 2 credits

*ECHM 490R: Directed undergraduate research/creative activity. Senior standing.*

1. Megan English, CHBE, Fall 2017, Spring 2018 (1 credit/term)
2. Theresa Leininger, CHBE, First summer session Summer 2018, 1 credit
3. Nathan Hovorka, CHBE, Spring 2018, 2 credits
4. Andrew Akerstrom, CHBE, Spring 2018, 2 credits
5. Allison Hayden, CHBE, Summer Session 2016, 3 credits
6. Anna-Rose Wendt, Spring 2016, 3 credits
7. Spencer Whyte, CHBE, Spring 2016, 3 credits
8. Joshua Pugh, CHBE (U. of Sheffield), Fall 2015-Spring 2016, 3 credits/term
9. Nikita Cardenas, CHBE, Spring 2015, 3 credits
10. Aubree Trunkle, CHBE, Fall 2015, 3 credits
11. Liana Bates, CHBE, Summer Session 2014, 3 credits

*ECHM 592: Directed research and study on an individual basis. Graduate standing.*

1. Logan Battrell, CHBE, Fall 2017, 3 credits
2. Dongyu Han, CHBE, Spring 2017, 3 credits
3. April Dower (co-advised), CHBE, Spring 2016, 1 credit
4. Mohammad Al-Azawii, ME, Fall 2015, 3 credits

## 2 Teaching

### 2.1 Journal Articles

1. [Accepted]: P. Gannon, R. Anderson, C. Plumb, D.J. Hacker, “Frack Attack”: An engaging classroom activity to integrate sustainability, *Chemical Engineering Education*, Fall 2018 issue.
2. M.B. Kubilius, R.S. Tu, R. Anderson, Integrating the ChE Curriculum via a recurring laboratory, *Chemical Engineering Education* 48 (2014) 221-230.

### 2.2 Awarded Contracts and Grants – Teaching

1. National Science Foundation: Research Initiation: Effectively Integrating Sustainability within an Engineering Program, Award 1544174, 01/01/16, 24 months, \$150,000.

### 2.3 Conference Presentations/Proceedings

*Presenting author italicized:*

1. *P. Gannon*, R. Anderson, C. Plumb, “Research initiation: effectively integrating sustainability within an engineering program: project accomplishments”, 125<sup>th</sup> ASEE Annual Conference and Exposition, June 2018.
2. *R. Anderson*, P. Gannon, C. Plumb, “Sustainability within technical engineering curriculum: a hydraulic fracturing module in fluid mechanics”, Canadian Engineering Education Association, June 2018, Paper #96.
3. R. Anderson, *A. Richards*, “WIP: Building the undergraduate chemical engineering community by involving capstone design students in undergraduate courses”, 125<sup>th</sup> ASEE Annual Conference and Exposition, June 2018.
4. *R. Anderson*, P. Himmer, T. Akmal, “Work in Progress - Group laboratory experiment during lecture in an undergraduate fluid dynamics class: increasing student learning and communication skills”, 125<sup>th</sup> ASEE Annual Conference and Exposition, June 2018.
5. M. Miller\*, C-H. Huang, T. Akmal, *R. Anderson*, P. Himmer, “Fluidic channels in the classroom: fabrication and integration in fluid mechanics”, 124<sup>th</sup> ASEE Annual Conference and Exposition, June 25-28, 2017, Paper ID #19770.
6. *P. Gannon*, R. Anderson, C. Plumb, “Research Initiation: Effectively integrating sustainability within an engineering program”, 124<sup>th</sup> ASEE Annual Conference and Exposition, June 25-28, 2017, Paper ID #18117.
7. *P. Gannon*, R. Anderson, J.W. Spengler, C. Plumb, “Exploring contemporary issues in sustainable energy”, 122<sup>nd</sup> ASEE Annual Conference and Exposition, June 14-17, 2015, Paper ID # 12177.
8. F. Karim, R. Anderson, R. Hall, “The development of a teaching assistant training program in applied science: design and implementation”, 118<sup>th</sup> ASEE Annual Conference and Exposition, June 26 - 29, 2011, AC 2011-2569.

### 2.4 Courses Taught

1. ECHM 412R: Chemical Engineering Design II (Spring 2018, 86 students)
2. ECHM 411R: Chemical Engineering Design I (Fall 2017, 86 students)
3. ECHM 321: Chem Engin Fluid Mechanic Ops (Fall 2017, 42 students)
4. ECHM 321: Chem Engin Fluid Mechanic Ops (Summer 2017, 5 students)
5. ECHM 412R: Chemical Engineering Design II (Spring 2017, 80 students)
6. ECHM 411R: Chemical Engineering Design I (Fall 2016, 81 students)

7. ECHM 321: Chem Engin Fluid Mechanic Ops (Fall 2016, 47 students)
8. ECHM 412R: Chemical Engineering Design II (Spring 2016, 79 students)
9. ECHM 411R: Chemical Engineering Design I (Fall 2015, 79 students)
10. ECHM 321: Chem Engin Fluid Mechanic Ops (Fall 2015, 38 students)
11. ECHM 443: Chem Engin Laboratory II (Spring 2015, 68 students)
12. ECHM 321: Chem Engin Fluid Mechanic Ops (Fall 2014, 17 students)
13. ECHM 535: Viscous Fluid Dynamics (Fall 2014, 2 students)
14. ECHM 443: Chem Engin Laboratory II (Spring 2014, 55 students)

## 2.5 Additional Teaching Responsibilities

1. Chemical Engineering Capstone Senior Design Mentor, ECHM 411/412, 14 groups (58 students) over 5 years, Sept. 2013-May 2018.
2. Letters of recommendation provided for 48 individual students.
3. Independent Study, Graduate ECHM 592
  - a. Logan Battrell: Models of PEM Fuel Cell Performance with Saturation Parameters (Fall 2017)
  - b. Dongyu Han: Numerical models of temperature profiles in packed beds (Spring 2017)
  - c. April Dower: Packed bed models with MATLAB (Spring 2016 w/ Dr. Erick Johnson)
  - d. Mohammad al-azawii: Experimental and Numerical Studies of Heat Transfer and Fluid Mechanics (Fall 2015)
4. Committee member for Ph.D. and M.S. graduate students (not direct supervisor):
 

*Defended:*

  - a. MS Committee Member, Drew Norton, Environmental Engineering, July 2017
  - b. MS Committee Member, Boris Illic, CHBE, Sept. 2016
  - c. Doctoral Committee Member, Prathish Rajaraman, CHBE, 2014-Nov. 2015
5. Committee member for M. Eng. graduate students (not direct supervisor)
 

*In Progress:*

  - a. M Eng Committee Member, Nathan Bolar (CHBE)
  - b. M Eng Committee Member, Heather Nold (Civil Engineering)

*Completed:*

  - c. M Eng Committee Member, Kelsey Miller, CHBE, Professional Paper, Nov. 2016
6. Graduate Representative: Matthew Adams (Physics; completed), David Buckingham (Physics)
7. Mechanical Engineering Capstone "Client", Portable Laser PIV System, 1 group (3 students), Sept. 2014 - May 2015.
8. Brazil Scientific Mobility Program: ECHM 490 Advisor, "Laboratory Equipment Upgrades to ECHM 442/443 Chemical Engineering Unit Operations", Palloma Martins and Gabriel Augusto, Summer 2015.
9. Guest Lectures: ECHM 424 (x5), ECHM 205 (x2), ECHM 405, ECHM 100 (x3), ECHM 321 (x2), EBIO 324, EMEC 405 (x1)

## 2.6 Professional Development

1. *Montana Engineering Education Research Center (MEERC)*, Member 2017-Present.
2. *TEER-MEERC Workshop Series*, Eight Workshops on Engineering Education Research Fundamentals, Fall 2017-Spring 2018.
3. *Certificate of Teaching Enhancement*, Center for Faculty Excellence, Montana State University, Spring 2017.
4. Attendance at several Center for Faculty Excellence Faculty Workshops, Montana State University, 2013-Present.



5. *Faculty Learning Community on Integrative Practices*, Montana State University, Spring Semester 2016.
6. *Blended Learning Workshop* by Paul Anderson, Montana State University, May 11, 2015.
7. Center for Faculty Excellence Program, *Effective Engineering Education* by Dr. Michael Prince, Montana State University, August 22, 2014.

### **3 Service**

#### **3.1 Membership in Professional Societies (Current and past)**

1. American Institute of Chemical Engineers (AIChE)
2. American Society of Mechanical Engineers (ASME)
3. American Society for Engineering Education (ASEE)
4. Electrochemical Society (ECS)

#### **3.2 Proposal and Journal Review**

1. *Proposals*: National Science Foundation, Thermal Transport Processes, Spring 2018.
2. *Journals and conferences*: Applied Energy, Applied Thermal Engineering, ASEE Conference 2015 and 2018, ASME FEDSM 2014, Canadian Engineering Education Association's Annual Conference 2018, Chemical Engineering Education, Electrochimica Acta, Energies, Energy, International Journal of Hydrogen Energy, Journal of Energy Storage, Journal of Power Sources, Meccanica, NCUR Spring 2017, Solar Energy

#### **3.3 Professional Committees**

1. AIChE Programming Co-Chair for the Transport and Energy Processes Division (Spring 2018-Present)
2. AIChE Programming Vice Chair for the Transport and Energy Processes Division (Summer 2014-Spring 2016)

#### **3.4 Conference Chair Positions**

1. Topical Five: Emerging Technologies in Clean Energy for the Twenty-First Century; *Advances in Fuel Cells and Batteries I & II*, AIChE 2015 Spring Meeting and 11<sup>th</sup> Global Congress on Process Safety, April 2015.
2. Topical Five: Emerging Technologies in Clean Energy for the Twenty-First Century; *Enabling Process Innovation through Computation-Epic I-IV*, AIChE 2015 Spring Meeting and 11<sup>th</sup> Global Congress on Process Safety, April 2015.

#### **3.5 University, College, and Departmental Committees**

1. Faculty Senate, Senator for Chemical and Biological Engineering, Sept. 2016 – Present.
2. ePALs director, College of Engineering, April 2018 - Present
3. Undergraduate Scholars Program (USP) Review Committee, Sept. 2014-Present.
4. National Conferences on Undergraduate Research, NCUR 2020 Year of Undergraduate Research Committee, April 2018 – Present.
5. Faculty Advisor for the ECS Student Chapter at Montana State University, Jan. 2014-Present.
6. Norm Asbjornson College of Engineering Design Integration Working Group, Fall 2017.
7. Search committee member: Non-tenure track teaching position in Chemical and Biological Engineering Department, April-June 2014.
8. Search committee member: Administrative Associate III position in Chemical and Biological Engineering department (Fall 2015, Spring 2018)

### **3.6 Public Service**

1. First Lego League (FLL) Judge, February 2014, 2015, 2016, 2018.
2. Advisor to students in science outreach: MSU NanoDays Spring 2016, 2017, 2018, MSU Engineer-a-thon Spring 2017, STEAM night at Bozeman Public Library, Spring 2017.
3. Science Fair Mentor for two students at Chief Joseph Middle School, Jan.-Feb. 2015.