2019 Data: CBE FACULTY ACTIVITY REPORTS
January 1, 2019 – December 31, 2019

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Faculty National and International Awards and Honors

Nicholas Brunelli
• Organic Reactions Catalysis Society: 2019 Robert Augustine Award
• Royal Society of Chemistry: 2019 Emerging Investigator Award

Bhavik Bakshi
• AIChE: 2019 Lawrence K. Cecil Award in Environmental Engineering; Cecil Lecture, AIChE Annual Meeting, Orlando
• AIChE: 2019 Sustainable Engineering Forum Education Award

Stuart Cooper
• American Chemical Society: Elected Fellow, Polymers Division

L.-S. Fan
• Indian National Academy of Engineering: Elected fellow

Li-Chiang Lin
• International Adsorption Society: 2019 Triennial Award for Excellence in Publications by a Young Member of the Society

Nicholas Brunelli
• AIChE: AIChE Futures, AIChE Journal

L.-S. Fan
• AIChE: Special Issue in Powder Technology honoring L.-S. Fan

Umit Ozkan

Barbara Wyslouzil
• Journal of Chemical Physics: Editors’ Choice Lecture
• Physical Chemistry Chemical Physics: Selected for 2019 HOT Articles collection
National Committee Appointments / Activity

Winston Ho
• International Scientific Committee: *Invited Member, 12th International Congress on Membranes and Membrane Processes, London*

Umit Ozkan
• Catalysis Society: *Vice-Chair, Organizing Committee, Catalysis Congress. This is the largest international meeting in catalysis, which is held every four years.*

Katelyn Swindle-Reilly
• Society for Biomaterials: *Program Chair, Ophthalmic Biomaterials, 2019-2021*

Jessica Winter
• AIChe: *Vice Chair, Chemical Technology Operating Council*

Professorships and Chairs

Li-Chiang Lin
• *Named the inaugural holder of the Umit S. Ozkan Professorship*

Andre Palmer
• *Named Fenburr Ohio Eminent Scholar in Nanotechnology, Molecular Self-Assembly*

Barbara Wyslouzil
• *ETH Zurich, Guest professorship*
Key Named and Invited Lectures

Jessica Winter
- Jacobus van t’ Hoff Lecture, Delft Process Technology Institute

Keynotes and Plenary Lectures

L.-S. Fan

Winston Ho

National Media

Bhavik Bakshi
- Interviews on WCMH TV, WV public radio, Sirius XM radio and other media outlets.

Eduardo Reategui
- Interview at NIH describing his single EV project, December 2019: https://www.youtube.com/watch?v=OeAA-HXVY2U

David Wood
- Featured expert, GEN (Genetic Engineering & Biotechnology News), “Microbial Culture Systems for Bioprocessing,” May 9, 2019
1. Aravind Asthagiri  
**Associate Professor**  
*Ph.D. Carnegie Mellon University*  
*Catalysis and surface chemistry with a computation and modeling approach*

**Grant Support**

- Alkane Oxidation on Late Transition-Metal Oxide Surfaces (PI: Jason Weaver, co-PI: Aravind Asthagiri), DOE-BES 9/1/2018-8/31/2021, $650,000
- Tailoring the active sites in heteroatom-doped carbon catalysts for oxygen reduction and oxygen evolution reactions (PI: Umit Ozkan, co-PIs: Aravind Asthagiri, co-PI: Anne Co), DOE-BES, 8/15/2017-8/14/2020, $625,000
- SUSCHEM: Surface science studies of the photo physics of copper oxides: toward sustainable CO2 recycling (PI: Jay Gupta, co-PI Aravind Asthagiri) NSF Chemistry, 8/1/2018-7/30/2021, $465,000

**Invited Lectures**

- “Selective Alkane Chemistry on IrO2(110) Surfaces”, Ohio State Materials Week, Columbus, OH (May 2019).
- “Selective Alkane Chemistry on IrO2(110) Surfaces”, American Chemical Society Spring Meeting, Orlando, FL (April 2nd 2019).

**Refereed Papers**

2. Bhavik Bakshi

Professor
Richard M. Morrow Endowed Chair
Ph.D. Massachusetts Institute of Technology
Sustainability science and process systems engineering

Awards and Honors

- Lawrence K. Cecil Award, 2019. Awarded by the Environmental Division of the American Institute of Chemical Engineers.
- Education Award, 2019. Awarded by the Sustainable Engineering Forum of the American Institute of Chemical Engineers.

Books and Chapters


Grant Support

- INFEWS/T1: Impacts of deglobalization on the sustainability of regional food, energy, water systems, National Science Foundation, $2,400,000, PI: Elena Irwin, co-PIs: Jeff Bielicki, Douglas Smith-Jackson, Jay Martin, et al., 2018-2021
- Including ecosystems in process design and life cycle assessment for environmental sustainability and innovation, National Science Foundation, $360,000, PI: Bhavik Bakshi, 2018-2021
- Plastics and Circular Economy, Global Kaiteki Institute, $25,000, PI: Bhavik Bakshi, 2019-2020

Invited Lectures

- Bakshi, B. R., “Technologies for Sustainable Development: How can Engineering Deliver?” Department of Chemical Engineering, Arizona State University, Tempe, AZ, October 28, 2019
- Bakshi, B. R., “Enhancing Resilience by Techno-Ecological Synergies”, Trans-Atlantic Research and Development Interchange on Sustainability (TARDIS), Estes Park, CO, Sep 9-11, 2019

**Refereed Papers**

3. Nicholas Brunelli

Professor
H.C. “Slip” Slider Professor
Ph.D. California Institute of Technology

Catalytic material design

Awards and Honors
- Robert Augustine Award presented by Organic Research Catalysis Society (ORCS)
- Lumley Research Award
- AIChE Futures, AIChE Journal
- Emerging Investigator, Royal Society of Chemistry, Reaction Chemistry and Engineering

Grant Support
- Designing Novel Types of Cooperative Effects to Influence Catalytic Performance, NSF CBET Catalysis, $340,000, PI: N.A. Brunelli, June 1, 2016 – May 31, 2020
- Understanding and Controlling Wax-Water Interactions in Pores of Fischer-Tropsch Synthesis Catalysts, NSF CBET Catalysis, $450,000 total ($175,000 for Ohio State), PI: David Hibbitts, Co-PI: N.A. Brunelli, August 1, 2019 to July 31, 2022.

Invited Lectures
- “Designing Catalytic Materials on the Atomic Level for Sustainable Biomass Conversion” N.A. Brunelli, Departmental Seminar at University of Notre Dame, February 26, 2019 (South Bend, IN 2019).
- “Catalytic site design for Lewis acid zeolites for the epoxide ring opening with alcohols.” N.A. Brunelli, ACS Fall Meeting, August 2019 (San Diego, CA).

Refereed Papers
• P. Ranade, A. Parulkar, N.A. Brunelli,* “Jet-Mixing Reactor for the Production of Monodisperse Silver Nanoparticles Using a Reduced Amount of Capping Agent,” Reaction Chemistry and Engineering (accepted).
• M.R. Whitaker, A. Parulkar, N.A. Brunelli, “Bifunctional solid acid catalyst incorporating a sulfoxide polymer for selective fructose dehydration to 5-hydroxymethylfurfural,” (accepted).
4. Jeffery J. Chalmers
Professor
Ph.D.  Cornell University
Intrinsic magnetization cell separation and Immunomagnetic cell separation, cancer detection, bioengineering

Grant Support

- Restricted Funding (Diversity Supplement-C. Gilbert): Fractionation of aged RBC's based on hemoglobin content, 07/05/2019 - 12/31/2019; NHBLI, Chalmers and Palmer PI.
- A scalable platform to selectively purify engineered extracellular vesicles via self- cleaving tags, NIGMS, 07/01/2019 - 04/30/2020; Wood and Chalmers; $215,492.00
- Fractionation of aged RBC based on hemoglobin content, NHLBI, 01/01/2017 - 12/31/2020; Chalmers and Palmer; $2,167,271.00
- Comprehensive Cancer Center support grant. NCI; 1990-2020; Chalmers, investigator.

Invited Lectures


Refereed Papers

5. John Clay  
**Professor of Practice**  
*Ph.D. The Ohio State University*  
*Unit Operations*

**Awards and Honors**  
- Ralph L. Boyer Award for Excellence in Undergraduate Teaching Engineering Innovation in 2019

6. Stuart Cooper  
**Professor**  
*Ph.D. Princeton University*  
*Polymer physics, block polymers, isomers, polyurethanes, biomaterials*

**Awards and Honors**  
- Elected Fellow, American Chemical Society, Polymers Division

**Books and Chapters**  

7. Ilham El-Monier  
**Assistant Professor of Practice**  
*Ph.D. Texas A&M University*  
*Fluid mechanics and petrophysics; fracturing and image analysis; reservoir engineering, characterization and formation damage*

**Grant Support**  
- $2000.00 grant from CERTAIN (Center for Energy Research, Training, and Innovation at OSU.)  
- $5400.00 fund for SPE student chapter at OSU from CERTAIN (2019).

**Refereed Papers**  
8. Liang-Shih Fan
Distinguished University Professor;
C. John Easton Professor
Ph.D. West Virginia University

Particle science and technology, clean energy and environmental systems, electrical capacitance volume tomography, and fluidization and multiphase flows

Awards and Honors
- Elected to Indian National Academy of Engineering as Foreign Fellow, November 1, 2019
- A Special Issue in Powder Technology in Honor of Professor L.-S. Fan (2019)

Books and Chapters

Grant Support
- Biomass gasification for chemicals production using chemical looping techniques; Department of Energy (DOE) Office of Energy Efficiency & Renewable Energy (EERE); $2,000,000 (PI); October 2016 to March 2021
- Biomass gasification for chemicals production using chemical looping techniques; Department of Energy (DOE) Office of Energy Efficiency & Renewable Energy (EERE); $2,000,000 (PI); October 2016 to March 2021
- 10 MWe CDCL large pilot plant demonstration - phase I feasibility; Department of Energy (DOE) National Energy Technology Laboratory (NETL); $240,000 (Subaward PI); June 2018 to July 2019
- Heat integration optimization and dynamic modeling investigation for advancing the coal direct chemical looping process; Department of Energy (DOE) National Energy Technology Laboratory (NETL)/Ohio Development Services Agency; $3,050,000 (Co-PI); October 2016 to December 2019
- Study on fluidization and distribution characteristics of coal particles in packed oxygen carrier particles operated in a counter-current moving bed reducer reactor for coal direct chemical looping system; Ohio Development Services Agency (ODSA); $ 160,000 (PI); January 2018 to February 2020

Invited Lectures
- “Chemical Looping Technology and Its Energy and Environmental Applications Implication” Civil Engineering Department, ETH Zurich, May 20, 2019.
• Banquet Speaker of the 16th International Fluidization Conference, Guilin, China, May 26-30, 2019.

**Refereed Papers**

- Liu, Yan; Lang, Qin; Zhuo, Cheng; Goetze, Josh; Kong, Fanhe; Jonathan; Fan, L.-S., “Near 100% CO Selectivity in Nanoscaled Iron-Based Oxygen Carriers for Chemical Looping Methane Partial Oxidation” Nature Communication 10, 5503 (2019), doi:10.1038/s41467-019-13560-0
- Guo, Mengqing; Zhuo, Cheng; Liu, Yan; Qin, Lang; Goetze, Josh; Fan, Jonathan; Fan, L.-S., “Cobalt doping modification for enhanced methane conversion at low temperature in chemical looping reforming systems” Catalysis Today, https://doi.org/10.1016/j.cattod.2019.06.016, (2019)
- Sines, Joshua; Hwang, Soohwan; Marashdeh, Qussai; Tong, Andrew; Wang, Dawei; He, Pengfei; Station, Benjamin; Zuccarelli, Christopher; Liang-Shih Fan, “Slurry bubble column measurements using advanced electrical capacitance volume tomography sensors”, Powder Technology, 355, Pages 474-480 (2019)
- Kong, Frank, and L.-S. Fan, “Process Analysis of Chemical Looping Systems for Dimethyl Ether Synthesis from Coal”; DOI: 10.1007/s41403-020-00085-y,
9. Lisa Hall

Associate Professor  
**Ph.D. University of Illinois at Urbana-Champaign**  
*Theory and simulation of polymeric materials*

**Grant Support**
- Design, Synthesis, and Characterization of Phase Change Materials Based on Nanoparticle-doped Block Ionene Polymers, Army Research Office (ARO), PI: Reza Montazami, Iowa State U; co-PIs: Hall; Matthew Green, Arizona State, August 1, 2018 – July 31, 2021, $70,000 (Amount to OSU)
- Molecular Design of Polymer-Grafted Nanoparticles for Next Generation Printed Electronics, Dayton Area Graduate Studies Institute (DAGSI), a local program with the Air Force Research Lab, PI: Hall, for student Jeffrey Ethier, July 1, 2018 – June 30, 2019, $48,751
- Modulating Phase Separation and Constituent Density Profiles in Nanostructured Polymer Electrolytes – Joint Experiment and Theory Effort in Tunable Hierarchical Assembly (This is a renewal of the prior DOE grant with Epps.), Department of Energy, BES Materials Chemistry, PI at U Delaware: Thomas Epps, III; PI at OSU: Hall, August 15, 2018 – August 14, 2021, $342,000
- CAREER: Modeling Polymer Electrolyte Microstructure: How Polymer Architecture Controls Ion Conduction, National Science Foundation DMR, PI: Hall, March 01, 2015 – February 31, 2020, $475,000
- Grant of compute time only: Hall Group Annual Allocation, Ohio Supercomputer Center PI: Hall, January 1, 2019 – December 31, 2019, 500,000 resource units, or approximately 5,000,000 CPU hours

**Invited Lectures**

**Refereed Papers**
10. Winston Ho

Distinguished Professor  
Ph.D. University of Illinois at Urbana-Champaign  

Molecular and chemical membrane separations: hydrogen purification, CO₂ capture, water desalination, wastewater metal recovery

Grant Support

- $1,248,278 (03/01/2016 – 08/31/2019), W.S. Winston Ho, PI; Department of Energy, National Energy Technology Laboratory (NETL): Novel CO₂-Selective Membranes for CO₂ Capture from <1% CO₂ Sources. OSURF Project No. 60051153.
- $1,000,000 (11/01/2016 – 04/30/2019), W.S. Winston Ho, PI; Ohio Development Services Agency (ODSA): Novel Prototype Membrane for CO₂ Capture. OSURF Project No. 60051653.
- $799,988 (10/01/2018 – 09/30/2021), W.S. Winston Ho, PI and Yang Han, Co-PI; Department of Energy, National Energy Technology Laboratory (NETL): Transformational Membranes for Pre-Combustion Carbon Capture. OSURF Project No. 60065059.
- $2,999,988 (07/01/2019 – 06/30/2022), W.S. Winston Ho, PI, Yang Han, Co-PI, and Li-Chiang Lin, Co-PI; Department of Energy, National Energy Technology Laboratory (NETL): AOI 1C: Novel Transformational Membranes and Process for CO₂ Capture from Flue Gas. OSURF Project No. 60068211.
- $150,000 (10/01/2019 – 09/30/2021), W.S. Winston Ho, PI and Yang Han, Co-PI; Ohio Department Services Agency: Transformational Membranes for Pre-Combustion Carbon Capture. OSURF Project No. 60070422.
- $500,000 (10/01/2019 – 09/30/2021), W.S. Winston Ho, PI and Yang Han, Co-PI; Ohio Department Services Agency: Novel Transformational Membranes and Process for CO₂ Capture from Flue Gas. OSURF Project No. 60070421.
- $209,933 (01/01/2019 – 03/31/2021), W.S. Winston Ho, OSU PI and Yang Han, OSU Co-PI; Subcontract from Gas Technology Institute (GTI), Department of Energy, National Energy Technology Laboratory (NETL): Bench-scale Development of an Advanced Graphene Oxide-based Membrane Process for Post-combustion CO₂ Capture.
$17,670 (05/01/2019 – 12/31/2021), W.S. Winston Ho, OSU PI; Subcontract from the Norwegian University of Science and Technology, Norway Research Council: Collaboration Agreement on Researcher Visits for Nanocomposite Facilitated Transport Membranes for H2 purification.

**Invited Lectures**

- W.S. Winston Ho, “New Amine-Based Membranes for H2 Purification and CO2 Capture”, Invited Seminar, Case Western Reserve University, Cleveland, OH, November 7, 2019.

**Patents**


**Refereed Papers**


11. Li-Chiang Lin  
Professor;  
Umit S. Ozkan Professor  
Ph.D. University of California-Berkeley  
Molecular simulations and quantum chemical calculations with atomic-level understandings

Awards and Honors
- Appointed as the inaugural holder of the Umit S. Ozkan Professorship
- Triennial Award from the International Adsorption Society (IAS) for Excellence in Publications in the field of adsorption science.

Grant Support
- Novel transformational membranes and process for CO2 capture from flue gas, DOE-NETL, PI: Winston Ho; Co-PI: Li-Chiang Lin, 7/1/2019 to 6/30/2022, $3,750,000
- Designing MOFs with cooperative binding mechanisms for selective small molecule separations, Institute of Materials Research, OSU, PI: Casey Wade; Co-PI: Li-Chiang Lin, 9/1/2019 to 8/31/2020, $40,000

Invited Lectures

Refereed Papers

12. Andrew Maxson

Assistant Professor of Practice
Ph.D. The Ohio State University
Unit Operations

Grant Support
• “Switchable surfactant solutions for failsafe reduction in turbulent drag”, OSU Technology Commercialization Office (Accelerator Award), $20,000, Andrew Maxson, July 1 2019 – December 31 2019
• "OSEP Chilled Water Drag Reduction by Surfactant Addition", Ohio State Energy Partners, $10,000, Andrew Maxson, April 2019 – no end date

Refereed Papers
13. Umit S. Ozkan

College of Engineering Distinguished Professor; Department Chair
Ph.D. Iowa State University
Heterogeneous and electro-catalysis, kinetics, and catalytic materials

Awards and Honors
- Honored by a special issue of the journal Catalysis Today (Volume 323, 270 pages, 2019).
- Endowed Professorship in CBE was named in honor

Books and Chapters

Grant Support
- In-situ and operando XAFS studies to design electrode catalysts for electrocatalytic processes involving H2O reduction: CO2 and H2O co-electrolysis and electrocatalytic NH3 production from N2 and H2O, Argonne National Laboratory (2020). 24 shifts of beamtime granted.

Invited Lectures
- “A Short Introduction to Graduate Programs at the Ohio State University, Institute de la Recherche sur la Catalyse et Environment (IRCELYON), Lyon, France, March 2019.
- “An Introduction to Electrocatalysis” Institute de la Recherche sur la Catalyse et Environment (IRCELYON), and Universite Claude Bernard Lyon, Lyon, France, April 2019.
- “An Introduction to Fuel Cells” Institute de la Recherche sur la Catalyse et Environment (IRCELYON), and Universite Claude Bernard, Lyon, France, April 2019.
- “Carbon-based Catalysts as Oxygen Reduction Reaction (ORR) and Oxygen Evolution Reaction (OER) in Acidic Media,” Technische Universität Berlin, Berlin, Germany, March 2019.
- “Carbon-based Catalysts as Oxygen Reduction Reaction (ORR) and Oxygen Evolution Reaction (OER) in Acidic Media,” Institute de la Recherche sur la Catalyse et Environment (IRCELYON) and Universite Claude Bernard, Lyon, France, April 2019.
“Catalysis Research at Ohio State: Examples from Electrocatalysis and Heterogeneous Catalysis” IPFEN, Lyon, France June 2019.

“Potentiometry Techniques” Institute de la Recherche sur la Catalyse et Environment (IRCELYON) and Universite Claude Bernard, Lyon, France, April 2019.


Patents


Refereed Papers


14. Andre F. Palmer

Professor
Ohio Eminent Scholar
Ph.D. The Johns Hopkins University
Biomaterials for transfusion medicine, tissue engineering

Awards and Honors
- Fenburr Ohio Eminent Scholar in Nanotechnology: Molecular Self-Assembly sample

Books and Chapters

Grant Support
- Attenuating the oxidative and myocardial side-effects of acellular hemoglobin (contact PI: Palmer, A.F., co-PI: Cabrales, P.), National Institutes of Health, Grant: R01HL126945-01A1, $1,507,222, 2016-2020
- Polymerized hemoglobins for facilitated oxygen transport in hepatic bioreactors (contact PI: Palmer, A.F., co-PI: Berthiaume, F.), National Institutes of Health, Grant: R01EB021926-01A1, $1,392,552, 2016-2020
- Fractionation of aged RBCs based on hemoglobin content (contact PI: Chalmers, J.J, co-PI: Palmer, A.F., co-PI: Zborowski, M.), National Institutes of Health
- Grant: R01HL131720-01A1, $2,670,860, 2017-2020
- PEGylated megahemoglobin for use as a red blood cell substitute (contact PI: Palmer, A.F., co-PI: Cabrales, P., co-PI: Kaumaya, P.), National Institutes of Health, Grant: R01HL138116-01, $2,875,118, 2017-2021

Invited Lectures
- A. Palmer, “Engineering polymerized hemoglobins for use in transfusion medicine and tissue engineering,” Department of Chemical Engineering, University of Michigan, Ann Arbor, MI, January 2019
- A. Palmer, “Engineering polymerized hemoglobins for use in transfusion medicine and tissue engineering,” Department of Chemical and Biomolecular Engineering, University of Maryland, College Park, MD, February 2019
- A. Palmer, “Engineering polymerized hemoglobins for use in transfusion medicine and tissue engineering,” Department of Chemical and Biomolecular Engineering, Johns Hopkins University, Baltimore, MD, February 2019
- A. Palmer, “Engineering oxygen therapeutics for use in transfusion medicine,” Amol Ajinkya Memorial Fund Lecture, Department of Chemical and Biological Engineering, University at Buffalo, SUNY, Buffalo, NY, October 2019
- A. Palmer, “Engineering oxygen therapeutics for use in transfusion medicine,” Department of Chemical Engineering, Texas Tech University, Lubbock, TX, January 2020
• A. Palmer, “Engineering oxygen therapeutics for use in transfusion medicine,” ISBS, Nara, Japan, November 2019

**Refereed Papers**


15. Joel Paulson

**Assistant Professor**  
**Ph.D. Massachusetts Institute of Technology**  
*Stochastic mathematical optimization problems that can be applied to chemical and biological systems*

**Invited Lectures**

**Refereed Papers**

16. James F. Rathman

**Professor**  
**Ph.D. University of Oklahoma**  
*Molecular informatics and modeling complex chemical and biological phenomena*

**Refereed Papers**
17. Eduardo Reategui  
**Assistant Professor**  
*Ph.D. University of Minnesota*  
*Microtechnologies, biomaterials, spectroscopy, immunoengineering, circulating biomarkers*

**Grant Support**

**Invited Lectures**
- Virginia Tech; Genetics, Bioinformatics and Computational Biology Program  
  Seminar Title: “New Technologies for Bulk and In Situ Molecular Analysis of Extracellular Vesicles as Cancer Biomarkers and Mediators of Cell Communication.”

**Patents**

**Refereed Papers**

18. Dave Tomasko  
**Assistant Professor**  
*Ph.D. Washington University in St. Louis*  
*Polymer synthesis, mechanical characterization, cell-material interactions, and controlled release*

**Grant Support**
- Human Connect: Scholarships in science, technology, engineering and Math (S-STEM), NSF-DUE, $597,000, 9/13-8/19, PI: D. L. Tomasko, Co-PI: H. Greene

**Refereed Papers**
  https://doi.org/10.1016/j.cep.2019.107566
19. Andrew Tong

Assistant Professor of Practice;
Research Assistant Professor
Ph.D. The Ohio State University

Process development of advanced combustion and clean energy systems, gas-solid fluidization

Books and Chapters

Grant Support
- Scale-up characteristics of a fluidized bed combustor reactor for coal direct chemical looping system: Cold flow model and heat transfer studies, Tech4Imaging (DOE), Andrew Tong, 10/2018, 2/2019, $160,000
- Heat integration optimization and dynamic modeling investigation for advancing the coal direct chemical looping process, DOE/NETL and ODSA, Andrew Tong (PI) and L.-S Fan (Co-PI) 10/2016, 12/2019, $1,500,000 (NETL) and $1,250,000 (ODSA)
- Thermogravimetric analysis of reforming catalyst, Praxair, Andrew Tong, 4/2019, 3/2020, $10,993
- 10 Megawatts electrical coal direct chemical looping large pilot plant - Pre-front end engineering and design study, DOE/NETL, L.-S. Fan (PI) and Andrew Tong (Co-PI), 4/2017, 3/2020, $350,000
- Biomass gasification for chemicals production using chemical looping techniques. DOE/EERE, L.-S. Fan and Andrew Tong, 10/2016, 9/2021(in renewal), $1,500,000
- Fate of sulfur from bituminous coal in the Ohio State coal direct chemical looping process, Andrew Tong, ODSA (OU Consortium), 2/2018, 5/2020, $160,000

Invited Lectures
- Moving Bed Chemical Looping Process for Partial and Full Carbonaceous Fuel Oxidation – Prospect and Development in Power and Chemical Production Applications, Praxair Headquarters, August 2019
- Chemical Process Development, ITRI Headquarters, August 2019
- Chemical Process Development, Chinese Academy of Science, July 2019
- Chemical Process Development, ENN, July 2019

Patents

Refereed Papers
20. William Wang

Assistant Professor
Ph.D. University of Wisconsin-Madison

Design of novel dynamic materials and systems based on colloidal and interfacial phenomena

Grant Support
- Start Up Fund, The Ohio State University, PI: Xiaoguang Wang, 01/01/2019-/31/2021, $925,000

Invited Lectures
- Invited seminar talk, Advanced Materials and Liquid Crystal Institute at Kent State University – Dec 4, 2019

Refereed Papers

21. Xiaoxue Wang

Assistant Professor
Ph.D. Massachusetts Institute of Technology

Material synthesis, molecular engineering, electronics, optoelectronics, soft materials using computational methods

Books and Chapters

Refereed Papers
22. Jessica Winter

**Professor**

**Ph.D. University of Texas at Austin**

*Nanotechnology for cancer imaging, cancer cell migration and energy storage*

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**Awards and Honors**


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**Grant Support**


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**Invited Lectures**

- “Role of Mechanics in the Cancer Microenvironment: Cautionary Tales,” Biomedical Engineering, Cleveland State University, Cleveland, OH, April 18, 2019.
- “Twenty Years Later: Why No Clinical Quantum Dot Imaging Labels?” Chemical Engineering, West Virginia University, Morgantown, WV, March 8, 2019.
- “Polymer Nanoparticle Composites for Bio-applications,” Chemical Engineering, Texas Tech University, Lubbock, TX, March 1, 2019.
- Panel Discussion: Advice and Mentorship from Female Leaders in Innovation and Entrepreneurship, AICHE Annual Meeting, Orlando, FL, November 11, 2019.

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**Patents**


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**Refereed Papers**

• [https://doi.org/10.1038/s41598-019-56983-x]
• J. Johnson, A. Dehankar, J. Winter, C. Castro (2019), Reciprocal control of hierarchical DNA origami-nanoparticle composites, Nano Letters, 19(12): 8469-75. [https://doi.org/10.1021/acs.nanolett.9b02786]
• [https://doi.org/10.1016/j.mser.2019.06.003]
• [https://doi.org/10.1021/acsbiomaterials.8b01390.]
23. David Wood
Professor
Ph.D. Rensselaer Polytechnic Institute
Biotechnology development through protein engineering

Grant Support
- “Breaking the yield bottleneck of fibrous squid protein”, (Wood, PI), Army Research Office, 05/17/2019 - 02/16/2020, $60,000
- “A scalable platform to selectively purify engineered extracellular vesicles via self-cleaving tags”, (Wood, PI w/ Jeff Chalmers), NIH (NIGMS), 07/01/2019 - 04/30/2021, $390,873
- “GP41 development for intein-mediated affinity capture”, Research Contract (Wood, PI), EMD Millipore Corp, 01/01/2020 - 12/31/2020, $150,000

Invited Lectures
- Rensselaer Polytechnic Institute: Isermann Dept. of Chemical and Biological Engineering, Troy, NY, October 23, 2019, "Intein-Based Bioseparations: Development of a Disruptive Technology for a Conservative Industry (with Lessons Learned)"

Refereed Papers
24. Barbara Wyslouzil

**Professor**  
**Ph.D. California Institute of Technology**  
**Aerosol and particle technology**

**Awards and Honors**
- Guest professorship at ETH

**Books and Chapters**

**Grant Support**
- $475,000 (2015-20). Barbara E. Wyslouzil, PI; National Science Foundation: Integratated studies of freezing.
- $355,000 (2015-20). Barbara E. Wyslouzil, PI; National Science Foundation: Heterogeneous nucleation on nanoparticles.
- $30,000 (2020) Cari Dutcher (U Mn), PI, Barbara Wyslouzil (Collaborator), Margaret Tolber (U Colorado, Collaborator); Support for the Conference: Molecular-Level Understanding of Atmospheric Aerosols (MUOAA 2020)

**Invited Lectures**
- Barbara E. Wyslouzil, Colloqium speaker ETH Zürich, March 12, 2019 “From vapor to nanocrystal in microseconds: The short lifefstoy of a nanodroplet”
- Barbara E. Wyslouzil, Invited speaker Chemisch-Physikalische Gesellschaft, University of Vienna, April 9, 2019, “CO2 condensation onto alkanes: Unconventional cases of heterogeneous nucleation”
- Barbara E. Wyslouzil, Invited speaker Liquids Gordon Conference, Holderness MA, August 7, 2019 “Crystallization of supercooled n-alkane nanodrops”

**Refereed Papers**
25. Shang-Tian Yang

Professor
Ph.D. Purdue University
Biochemical, metabolic, tissue engineering and biotechnology

Awards and Honors
- sample
- sample

Books and Chapters

Grant Support
- “An integrated process for butanol production from cellulosic biomass and CO2 using engineered clostridia in a linear immobilized bioreactor”, Source of Support: Department of Energy SBIR Phase I PI: David Ramey (BioMissions LLC), ST Yang, 7/2/2018 - 7/1/2019, $150,000

Invited Lectures
- “Stem cell engineering in (micro)bioreactor: from regenerative medicine to high-throughput screening for drug discovery” School of Biotechnology and Bioengineering, Jiangnan University, Wuxi, Jiangsu, China, May 3, 2019.
- “Biorefinery for Sustainable Production of Fuels and Chemicals” School of Food Science and Biological Engineering, Hefei University of Technology, May 7, 2019.
- “Engineering clostridia for biofuels production from biomass and CO2” Department of Chemical and Environmental Engineering, University of Cincinnati, Cincinnati, Ohio, September 13, 2019.
- “Biorefinery for Sustainable Production of Fuels and Chemicals” School of Chemistry and Chemical Engineering, Nanjing Forestry University, September 26, 2019.
- “Stem cell engineering in (micro)bioreactor: from regenerative medicine to high-throughput screening for drug discovery” School of Bioscience and Bioengineering, South China University of Technology, Guangzhou, China, December 13, 2019.
- “Biorefinery for Sustainable Production of Fuels and Chemicals” School of Bioscience and Bioengineering, South China University of Technology, Guangzhou, China, December 16, 2019.
- “Biorefinery for Sustainable Production of Fuels and Chemicals” School of Chemistry and Chemical Engineering, Nanjing Forestry University, December 16, 2019.
- “Bioproduction of butyrate by Clostridium tyrobutyricum for probiotic application” School of Animal Science and Technology, Zhejiang University, Hangzhou, Zhejiang, China, December 17, 2019.
- 8.b. Invited or Keynote Lectures at Conferences
  - “Keynote: Engineering clostridia for n-butanol production from lignocellulosic biomass and CO2” Session on “Biofuels and Biorefinery” at The Second Synthetic Biology World Forum, Nanjing, Jiangsu, China, September 25, 2019.
Refereed Papers

- S Liu, X Zhang, F Liu, M Xu, T Yang, M Long, J Zhou, T Osire, ST Yang, Z Rao, Designing of a cofactor self-sufficient whole-cell biocatalyst system for production of 1,2-amino alcohols from epoxides, ACS Synthetic Biology, 8: 734–743 (2019).
- W Li, C Cheng, G Cao, ST Yang, N Ren, Potential of hydrogen production from sugarcane juice by Ethanoligenens harbinense Yuan-3, J Cleaner Production, 237: 117552 (2019).


