Prof. Yang Xiao, Ph. D.

Assistant Professor of Chemical Engineering
Principal Investigator of the *Reaction Engineering and Catalysis Science Laboratory (RECSL)*
Department of Chemical Engineering, Institute for Micromanufacturing (IfM)
Louisiana Tech University, 505 Tech Drive, Ruston, LA 71272
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Education and Professional Preparation

Postdoc	**Purdue University** (West Lafayette, Indiana)	2015 - 2018
Ph.D. in Chemical Engineering	**Southeast University** (Nanjing, China)	2010 - 2015
Co-advisors:		
Prof. Arvind Varma, Purdue University		*2012 - 2015*
Prof. Guomin Xiao, Southeast University		*2010 - 2012*
B.S. in Chemical Engineering	**Southeast University** (Nanjing, China)	2006 - 2010

Ph. D. Dissertation

Yang Xiao, Heterogeneous Catalysis for Biodiesel Production and Utilization of its Byproduct Crude Glycerol by Selective Oxidation, Southeast University (China), May **2015**, 137 + xii pages. Co-advised by Prof. Arvind Varma *(Purdue University)* and Prof. Guomin Xiao *(Southeast University).*

Appointments

Assistant Professor	Louisiana Tech University	2022 - Present
Senior Research Engineer (PI)	Purdue University	2019 - 2022
Research Scientist	Purdue University	2018 - 2019

Selected Awards

College of Engineering and Science's Research Award	Louisiana Tech University	2025
Doctoral New Investigator Award	ACS Petroleum Research Fund	2025
Early Career Excellence in Research Award	Louisiana Tech University	2025
Engineering Research Initiation Award	U.S. National Science Foundation	2024
Research Enhancement Awards	Louisiana Space Grant Consortium	2023-2024
Collaborative Partnership Awards	Louisiana Materials Design Alliance	2023-2025
Young Investigator Travel Award	Intl. Symp. Chem. React. Eng.	2023

Grants

(15) *"MICA: Microsystem Induced CAtalysis"*

U.S. Department of Defense $1,849,538 2025 - 2028

Co-PI: Dr. Yang Xiao

(14) *"SMS: Simulating Microbial Systems"*

U.S. Department of Defense $1,379,264 2025 - 2026

Co-PI: Dr. Yang Xiao

(13) *"First-Principles and Machine Learning Investigations of High-Entropy MXene Catalysts"*

Louisiana Materials Design Alliance *(Track 1B)* $40,000 2025 - 2026

PI: Dr. Yang Xiao

(12) *"Selective Semi-Hydrogenation of Acetylene to Ethylene over Two-Dimensional Nanolayer Catalysts"*

ACS Petroleum Research Fund *(69076-DNI5)* $ 110,000 2025 - 2027

PI: Dr. Yang Xiao

(11) *"Understanding the Stability of MXene-Confined Nanolayer Catalysts for Ethane Dehydrogenation"*

U.S. National Science Foundation *(CBET # 2414204)* $ 335,964 2024 - 2027

PI: Dr. Yang Xiao **Co-PI**: Dr. Daniela Mainardi

(10) *"Advancing Catalytic Conversion of Methane to Carbon-Free Hydrogen and Ethane"*

U.S. National Science Foundation *(CBET # 2347475)* $ 199,954 2024 - 2026

PI: Dr. Yang Xiao

(9) *"Presenting Louisiana Tech University's NASA-Related Energy Research at NASCRE-5"*

Louisiana Board of Regents *(TAP)* $ 2,500 2025

PI: Dr. Yang Xiao

(8) *"Computational Investigation of the Stability of High-Entropy MXene Catalysts"*

Louisiana Materials Design Alliance *(Track 1B)* $40,000 2024 - 2025

PI: Dr. Yang Xiao

(7) *"Photo-Thermo Catalysis Enhanced Oligomerization of Olefins to Liquid Rocket Propellant Fuels"*

Louisiana Space Grant Consortium *(REA)* $35,000 2024 - 2025

PI: Dr. Yang Xiao

(6) *"Conversion of Methane to Transportation Fuels via Photo-Thermo Catalysis"*

Louisiana Transportation Research Center *(TIRE)* $30,000 2024 - 2025

PI: Dr. Yang Xiao

(5) *"Characterization of Catalysts using Time-of-Flight Secondary Ion Mass Spectrometry"*

Louisiana Materials Design Alliance *(LINK)* $7,000 2024

PI: Dr. Yang Xiao

(4) *"Developing Structure-Property Relation of HE-MXene Catalysts Using Machine Learning"*

Louisiana Materials Design Alliance *(SURE)* $5,000 2024 -2025

PI: Dr. Yang Xiao

(3) *"Design Catalytically Active Sites at High-Entropy MXene and Metallic Nanolayer Interfaces"*

Louisiana Materials Design Alliance *(Track 1B)* $39,953 2023 - 2024

PI: Dr. Yang Xiao

(2) *"Catalytic Conversion of Methane to Liquid Rocket Propellant Fuels"*

Louisiana Space Grant Consortium *(REA)* $35,000 2023 - 2024

PI: Dr. Yang Xiao

(1) *"Catalytic Activation of Methane"*

Purdue University *(Varma Rxn. Eng. Fund)* $200,000 2019 - 2022

PI: Dr. Yang Xiao

Research Group

Ph.D. Graduate Students:

Tobias K. Misicko (Ph.D. candidate)	Louisiana Tech University	*2022 - present*
Recipient of the 2025 DOE Office of Science Graduate Student Research (SCGSR) Fellowship		
Joaquin Herrero	Louisiana Tech University	*2024 - present*
Jiaping Weng	Louisiana Tech University	*2024 - present*
Jacob Robinson	Louisiana Tech University	*2024 - present*
Robert Martin	Louisiana Tech University	*2025 - present*
Keshar Sanjel	Louisiana Tech University	*2025 - present*

Undergraduate Students:

Piper Smith	Louisiana Tech University	*2023 - present*
Caroline Cresap	Louisiana Tech University	*2023 - present*
Kaleigh Louque	Louisiana Tech University	*2024 - present*
Recipient of the 2025 DOE Science Undergraduate Laboratory Internships (SULI)		
Katherine Cortez	Louisiana Tech University	*2024 - present*
Sabrina Stone	Louisiana Tech University	*2024 - present*
Andres Rodriguez	Louisiana Tech University	*2024 - present*
Natalie Rayne Remedies	Louisiana Tech University	*2025 - present*
Aliya Kattash	Louisiana Tech University	*2025 - present*

Group Alumni

Master's Graduate Student:

Henrik Ketting	Louisiana Tech University	*2023 - 2024*
Gabriel Chukwuka *(co-advised)*	Louisiana Tech University	*2023 - 2025*

Undergraduate Students:

Brady Duplessis	Louisiana Tech University	*2022 - 2023*
Paul Macip	Louisiana Tech University	*2022 - 2023*
Jacob Christ	Louisiana Tech University	*2022 - 2023*
Sean Clay	Louisiana Tech University	*2023 - 2024*
Sarah Siharath	Louisiana Tech University	*2023 - 2024*
Gregory Allen	Louisiana Tech University	*2023 - 2024*
Suraj Dahal	Louisiana Tech University	*2024*
Sudip Regmi	Louisiana Tech University	*2024*
Robert Martin	Louisiana Tech University	*2023 - 2025*

High School Students:

Piper Smith		*2023*
Mir Z. Ali		*2023*

Teaching Experience

Chemical Plant Design I (CMEN 431)	Louisiana Tech University	2024 - present
Chemical Plant Design II (CMEN 432)	Louisiana Tech University	2024 - present
Chemical Plant Design III (CMEN 434)	Louisiana Tech University	2025 - present
Sustainable Chemical Processes (CMEN 450C/557)	Louisiana Tech University	2022 - 2024
Transport Phenomena (CMEN 304)	Louisiana Tech University	2022 - 2024
Engineering Problem Solving II (ENGR 121)	Louisiana Tech University	2022 - 2023
Heat and Mass Transfer (CHE 378)	Purdue University	2021
Chemical Reaction Engineering (CHE 660)	Purdue University	2019

Peer-Reviewed Journal Publications

$*$ *corresponding authors;* † *these authors contributed equally*

35. Gabriel Parker†, Tobias K. Misicko†, Tanguy Teriler, Yang Xiao, and Xiao-Ying Yu*, ToF-SIMS Spectral Analysis of Pristine and Neutron Irradiated Single Crystal Tungsten, *Results in Surfaces and Interfaces*, **2025**, 20, 100577.
34. Joaquin Herrero†, Peilei He†, Fan Yang, Jiaping Weng, Nicole LiBretto, Daniela S. Mainardi1, Jeffrey T. Miller*, Yue Wu*, and Yang Xiao*, Synergy of Cu(I) and Oxygen Vacancies in CO_2 Hydrogenative Coupling to Ethanol on Cu/CeO_{2-x} Catalysts, *Nano Research*, **2025**, 18(8), 94907518.
33. Rui Zhou, Mingzhou Jin*, Zhenglong Li, Yang Xiao, David McCollum, and Alicia Li, Techno-economic Analysis and Network Design for CO_2 Conversion to Jet Fuels in the United States, *Renewable and Sustainable Energy Reviews*, **2025**, 210, 115191.

32. Hao Li, Xue Liu, Yang Xiao*, and Kun Cao*, One-pot Synthesis of 5-Norbornene-2,3-Dicarboxylic Anhydride with High Exo/Endo Ratio in a Microreactor under High Temperature and Appropriate Pressure, *Chemical Engineering Journal*, **2024**, 498, 155561.
31. Hao Li, Xue Liu, Yan Zhang, Yang Xiao*, and Kun Cao*, A Kinetic Model of the Cycloaddition Reactions Between Cyclopentadiene and 1, 3-Butadiene for Synthesis of 5-vinyl-2-norbornene, *The Canadian Journal of Chemical Engineering*, **2024**, 102 (5), 1946-1956.
30. Zhe Li†, Tobias K. Misicko†, Fan Yang†, Xiaopeng Liu, Zhenwei Wu, Xiaoyang Gao, Tao Ma, Jeffrey T. Miller, Daniela S. Mainardi, Collin D. Wick, Zhenhua Zeng*, Yang Xiao*, and Yue Wu*, Two-dimensional Atomically Thin Pt Layers on MXenes: The Role of Electronic Effects During Catalytic Dehydroge nation of Ethane and Propane, *Nano Research*, **2024**, 17 (3), 1251-1258.
29. Zhichao Shang, Teng Wang, Aoxia Ren, Yong Yu, Yan Zheng, Yuan Tao, Peizhong Feng, Yang Xiao*, and Xiaohong Wang*, Hollow Macroporous CeO_2/β-Bi_2O_3 Heterostructure Sphere via One-step Spray Solution Combustion Synthesis for Efficient Photocatalysis, *Applied Surface Science*, **2023**, 619, 156718.
28. Zhichao Shang, Yong Yu, Hang Yang, Zhongxiang Yang, Yang Xiao*, and Xiaohong Wang*, One-step Solution Combustion Synthesis of Micro/nano-scale Porous Cu/CeO_2 with Enhanced Photocatalytic Properties, *Journal of Rare Earths*, **2023**, 41 (2), 250-258.
27. Yang Xiao*, Anand Ramanathan, Bala Subramaniam*, and Arvind Varma, Guaiacol Hydrodeoxygenation and Hydrogenation over Bimetallic Pt-M (Nb, W, Zr)/KIT-6 Catalysts with Tunable Acidity, *ACS Sustainable Chemistry & Engineering*, **2022**, 10 (15), 4831-4833.
26. Zhe Li†, Yang Xiao*†, Prabudhya Roy Chowdhury, Zhenwei Wu, Tao Ma, Johnny ZhuChen, Gang Wan, Tae-Hoon Kim, Dapeng Jing, Peilei He, Pratik J. Potdar, Lin Zhou, Zhenhua Zeng, Xiulin Ruan, Jeffrey T. Miller, Jeffrey P. Greeley, Yue Wu*, and Arvind Varma, Direct Methane Activation by Atomically Dispersed Platinum Nanolayers on Two-dimensional Metal Carbides (MXenes), *Nature Catalysis*, **2021**, 4, 882-891.
25. Ruiping Wei, Xumin Qu, Yang Xiao*, Jingdeng Fan, Gaoli Geng, Lijing Gao, and Guomin Xiao*, Glycerol Hydrogenolysis Propanediols over Silicotungstic Acid Catalysts Intercalated with CuZnFe Hydrotalcite-like Compounds, *Catalysis Today*, **2021**, 368, 224-231.
24. Chunxiao Xu, Yayong Li, Ryan A. Adams, Vilas G. Pol, Yang Xiao*, Arvind Varma, and Pengwan Chen*, One-Step Combustion Synthesis of Carbon-Coated NiO/Ni Composites for Lithium and Sodium Storage, *Journal of Alloys and Compounds*, **2021**, 310, 110578.
23. Yuanfeng Wu, Yang Xiao, Hui Yuan, Zongqi Zhang, Shengbin Shi, Ruiping Wei, Lijing Gao, and Guomin Xiao*, Imidazolium Ionic Liquid Functionalized UiO-66-NH_2 as Highly Efficient Catalysts for Chemical Fixation of CO_2 into Cyclic Carbonates, *Microporous and Mesoporous Materials*, **2021**, 310, 110578.
22. Feng Jiang, Shanshan Wang, Bing Liu, Jie Liu, Li Wang, Yang Xiao, Yuebing Xu, and Xiaohao Liu*, Insights into the Influence of CeO_2 Crystal Facet on CO_2 Hydrogenation to Methanol over Pd/CeO_2 Catalysts, *ACS Catalysis*, **2020**, 10 (19), 11493–11509.
21. Zhichao Shang, Zhongxiang Yang, Yang Xiao*, and Xiaohong Wang*, Ordered Mesoporous Ag/CeO_2

Nanocrystalline via Silica-templated Solution Combustion for Enhanced Photocatalytic Performance, *Colloids and Surfaces A: Physicochemical and Engineering Aspects*, **2020**, 604, 125301.

20. Yang Xiao*, Rexonni Lagare, Lindsey Blanshan, Enrico N. Martinez, and Arvind Varma, Refinement of the Kinetic Model for Guaiacol Hydrodeoxygenation over Platinum Catalysts, *AIChE Journal*, **2020**, 66 (5), e16913.
19. Kanak Roy, Luca Artiglia, Yang Xiao, Arvind Varma*, and Jeroen A. van Bokhoven*, Role of Bismuth in the Stability of Pt-Bi Bimetallic Catalyst for Methane Mediated Deoxygenation of Guaiacol, an APXPS study, *ACS Catalysis*, **2019**, 9 (4), 3694-3699.
18. Johnny ZhuChen, Zhenwei Wu, Xiaoben Zhang, Slgi Choi, Yang Xiao, Arvind Varma*, Wei Liu, Guanghui Zhang, and Jeffrey T. Miller*, Identification of the Structure of the Bi Promoted Pt Non-oxidative Coupling of Methane Catalyst: A Nanoscale Pt_3Bi Intermetallic Alloy, *Catalysis Science & Technology*, **2019**, 9, 1349-1356.
17. Yuan Wang, Yang Xiao*, and Guomin Xiao, Sustainable Value-added C_3 Chemicals from Glycerol Transformations: A Mini Review for Heterogeneous Catalytic Processes, *Chinese Journal of Chemical Engineering*, **2019**, 27, 1536-1542.
16. Xiaoni Du, Xiaohong Wang*, and Yang Xiao, $Bi_5O_7NO_3$ and $Ag/Bi_5O_7NO_3$ Composites: One-step Solution Combustion Synthesis, Characterization and Photocatalytic Properties, *CrystEngComm*, **2018**, 20, 7536-7542.
15. Yang Xiao, Yuan Wang, and Arvind Varma*, Low-Temperature Selective Oxidation of Methanol over Pt-Bi Bimetallic Catalysts, *Journal of Catalysis*, **2018**, 363, 144-153.
14. Yang Xiao and Arvind Varma*, Highly Selective Nonoxidative Coupling of Methane over Pt-Bi Bimetallic Catalysts, *ACS Catalysis*, **2018**, 8 (4), 2735-2740.
13. Yang Xiao and Arvind Varma*, Bio-oil Upgrading Using Methane: A Mechanistic Study of Model Compound Guaiacol Reactions over Pt-Bi Bimetallic Catalysts, *ACS Sustainable Chemistry & Engineering*, **2018**, 6 (12), 17368-17375.
12. Yang Xiao and Arvind Varma*, Kinetics of Glycerol Conversion to Hydrocarbon Fuels over Pd/H-ZSM-5 Catalyst, *AIChE Journal*, **2017**, 63 (12), 5445-5451.
11. Yang Xiao and Arvind Varma*, Kinetics of Guaiacol Deoxygenation over the Pt-Bi Catalyst, *Reaction Chemistry & Engineering*, **2017**, 2, 36-43.
10. Yang Xiao, Jeffrey Greeley, Arvind Varma*, Zhi-Jian Zhao, and Guomin Xiao, An Experimental and Theoretical Study of Glycerol Oxidation to 1,3-Dihydroxyacetone Over Bimetallic Pt-Bi Catalysts, *AIChE Journal*, **2017**, 63 (2), 705-715. **(as Most Read Article)**
9. Yang Xiao and Arvind Varma*, Conversion of Glycerol to Hydrocarbon Fuels via Bifunctional Catalysts, *ACS Energy Letters*, **2016**, 1 (5), 963-968.
8. Danni Gao, Yang Xiao, and Arvind Varma*, Guaiacol Hydrodeoxygenation over Platinum Catalyst: Reaction Pathways and Kinetics, *Industrial & Engineering Chemistry Research*, **2015**, 54 (43), 10638-10644.

7. Yang Xiao and Arvind Varma*, Catalytic Deoxygenation of Guaiacol Using Methane, *ACS Sustainable Chemistry & Engineering*, **2015**, 3 (11), 2606-2610.
6. Haoyang Li, Xiaomei Pan, Yang Xiao, Guomin Xiao*, and Jinjin Huang, Simulation of Biodiesel Industrial Production via Solid Base Catalyst in a Fixed-bed Reactor, *Journal of Southeast University (English Edition)*, **2014**, 30 (3), 380-386.
5. Yang Xiao, Guomin Xiao, and Arvind Varma*, A Universal Procedure for Crude Glycerol Purification from Different Feedstocks in Biodiesel Production: Experimental and Simulation Study, *Industrial & Engineering Chemistry Research*, **2013**, 52 (39), 14291-14296.
4. Yang Xiao, Haoyang Li, Guomin Xiao*, Lijing Gao, and Xiaomei Pan, Simulation of the Catalytic Reactive Distillation Process for Biodiesel Production via Transesterification, *International Conference on Materials for Renewable Energy and Environment*, Chengdu, China, **2013**, 1, 196-199.
3. Guomin Xiao*, Haoyang Li, and Yang Xiao, Applications of Chemical Simulation Softwares in the Course of Transport Phenomena, *Chemical Industry Times*, **2012**, 26 (10), 53-59.
2. Yang Xiao, Lijing Gao, Guomin Xiao*, Baosong Fu, and Lei Niu, Experimental and Modeling Study of Continuous Catalytic Transesterification to Biodiesel in a Bench-Scale Fixed-Bed Reactor, *Industrial & Engineering Chemistry Research*, **2012**, 51 (37), 11860-11865.
1. Yang Xiao, Lijing Gao, Guomin Xiao*, and Jianhua Lv, Kinetics of the Transesterification Reaction Catalyzed by Solid Base in a Fixed-bed Reactor, *Energy & Fuels*, **2010**, 24 (11), 5829-5833.

U. S. Patents and Patent Applications

9. Yang Xiao, Tobias Misicko, Xiaopeng Liu, and Yue Wu, Metal Carbide-based Catalyst Systems For Plastic Recycling, Patent Application 18/913,376, October 11, **2024**.
8. Yang Xiao, Zhe Li, Yue Wu, and Fan Yang, Transition Metal Carbides for Catalytic Dehydrogenation of Short Alkanes, Patent Application US20240140886A1, October 16, **2023**.
7. Yang Xiao, Arvind Varma, Zhe Li, and Yue Wu, Transition Metal Carbides for Catalytic Methane Activation, Patent No. US11524279B1, December 13, **2022**.
6. Nien-Hwa Linda Wang, Kai Jin, Clayton Gentilcore, and Yang Xiao, Integrated Continuous Conversion and Separation Methods for Upcycling Mixed Plastic Waste to Clean Gasoline and Diesel Fuels and Other Products, Patent Application US20230250343A1, July 9, **2021**.
5. Yang Xiao, Arvind Varma, Anand Ramanathan, and Bala Subramaniam, Method of Enhanced Aromatic Products from Bio-oil Upgrading, Patent Application US20220356137A1, June 22, **2019**.
4. Yang Xiao and Arvind Varma, Catalytic Deoxygenation of Bio-Oils Using Methane, Patent, No. US10023809 B2, July 17, **2018**.
3. Yang Xiao and Arvind Varma, Method of Producing Formaldehyde from Methanol, Patent No. US10392333B2, December 19, **2018**.
2. Yang Xiao and Arvind Varma, Method of Conversion of Glycerol to Hydrocarbon Fuels, Patent No. US10781376B2, October 3, **2018**.

1. Yang Xiao and Arvind Varma, Non-oxidative Production of Hydrocarbon from Methane, Patent No. US10450247B2, September 19, **2018**.

Peer-Reviewed Conference Presentations and Invited Talks

45. Tobias Misicko, and Yang Xiao*, Engineering Reaction-Diffusion Behavior in Mxene-Based Catalysts for Ethane Dehydrogenation *AIChE Annual Meeting*, Boston, MA, November 2 - 6, **2025**.
44. Tobias Misicko, Xiao-Peng Liu, Yue Wu*, and Yang Xiao*, Activation of Short Alkanes via Selective Passivized Catalysis, *2025 Great Plains Catalysis Society Annual Symposium*, Ames, Iowa, August 10 - 11, **2025**.
43. Tobias Misicko and Yang Xiao, Quantifying Reaction-Diffusion Phenomena of Ethane Dehydrogenation on Two-Dimensional Metal Carbide Catalyst, *The 29th North American Catalysis Society Meeting (NAM29)*, Atlanta, Georgia, June 8 - 13, **2025**.
42. Yang Xiao, Methane Activation: Bridging the Gap Between Catalysis and Reaction Engineering ***(invited talk for graduate students in the department of chemical engineering)***, *University of Louisiana at Lafayette*, Lafayette, Louisiana, February 24, **2025**.
41. Joaquin Herrero, Tobias Misicko, and Yang Xiao, Machine Learning for Parametric Sensitivity of Chemical Reactors, *The 5th North American Symposium on Chemical Reaction Engineering (NASCRE-5)*, Houston, Texas, February 16 - 19, **2025**.
40. Tobias Misicko and Yang Xiao, Quantifying Reaction-Diffusion Rates of Nonoxidative Coupling of Methane per Active Edge Sites of Two-Dimensional Pt Nanolayer Catalysts, *The 5th North American Symposium on Chemical Reaction Engineering (NASCRE-5)*, Houston, Texas, February 16 - 19, **2025**.
39. Yang Xiao, Tobias Misicko, and Xiaoyang Gao, Thermal Runaway of Chemical Reactors: An Experimental, Modeling and Machine-Learning Investigation, *AIChE Annual Meeting*, San Diego, CA, October 27 - 31 , **2024**.
38. Yang Xiao, Tobias Misicko, Xiaoyang Gao, and Daniela Mainardi, Catalytically Active Edge Sites of MXene-Confined Pt Nanolayers for Conversion of Short Alkanes, *AIChE Annual Meeting*, San Diego, CA, October 27 - 31 , **2024**.
37. Yang Xiao, Zhe Li, Tobias Misicko, Jeff T. Miller, Yue Wu, and Arvind Varma, Atomically Thin Platinum Nanolayers on MXene for Catalytic Non-oxidative Coupling of Methane, *The 27th International Symposium for Chemical Reaction Engineering (ISCRE 27)*, Quebec City, Quebec, Canada, June 11-14, **2023**.
36. Tobias Misicko and Yang Xiao Thermal Runaway of Catalytic Reactors: an Experimental,Modeling and Machine-Learning Study *Southeastern Catalysis Society 2023 Annual Symposium*, Tuscaloosa, AL, February 27 - 28, **2023**.
35. Yang Xiao, Tobias Misicko, Jeffrey Miller, and Yue Wu, Atomically Thin Pt Nanolayer Catalysts Supported on Two-dimensional Molybdenum Titanium Carbide (MXene) for Shale Gas Conversion, *Southeastern Catalysis Society 2023 Annual Symposium*, Tuscaloosa, AL, February 27 - 28, **2023**.
34. Zhe Li, Yang Xiao, Prabudhya Chowdhury, Zhenwei Wu, Tao Ma, Johnny Zhuchen, Gang Wan, Tae-

Hoon Kim, Dapeng Jing, Peilei He, Pratik Potdar, Lin Zhou, Zhenhua Zeng, Xiulin Ruan, Jeffrey T. Miller, Jeffrey Greeley, Yue Wu, and Arvind Varma, Nonoxidation Coupling of Methane over Nano-Layer Platinum Catalysts on Two-Dimensional Metal Carbides (MXenes), *AIChE Annual Meeting*, Phoenix, AZ, November 13 - 18, **2022**.

33. Yang Xiao, Anand Ramanathan, Bala Subramaniam, and Arvind Varma, Guaiacol Hydrodeoxygenation and Hydrogenation over Bimetallic Pt-M (Nb, W, Zr)/KIT-6 Catalysts with Tunable Acidity *AIChE Annual Meeting*, Phoenix, AZ, November 13 - 18, **2022**.
32. Yang Xiao, Pratik Potdar, Kaida Liu, Arvind Varma, and Guomin Xiao A Machine Learning Tool for Thermal Runaway Prediction of Chemical Reactors *AIChE Annual Meeting* (Virtual) November 16 - 20, **2020**.
31. Yang Xiao, Feng Jiang, Guomin Xiao, and Arvind Varma, CO_2 Hydrogenation to Ethanol over Pd/Bi_2O_3 Catalysts: The Synergistic Effect of Pd Particle Size and Surface Oxygen Vacancy *AIChE Annual Meeting* (Virtual) November 16 - 20, **2020**.
30. Yang Xiao and Arvind Varma, Parametric Sensitivity and Runaway in Fixed-Bed Reactors: Example of Methanol Selective Oxidation over Pt-Bi Catalysts, *AIChE Annual Meeting*, Orlando, Florida, November 10-15, **2019**.
29. Yang Xiao, Anand Ramanathan, Bala Subramaniam, and Arvind Varma, Enhanced Aromatic Selectivity during Deoxygenation of Phenolic Model Compounds over Bifunctional Catalysts, *AIChE Annual Meeting*, Orlando, Florida, November 10-15, **2019**.
28. Yang Xiao, Anand Ramanathan, Bala Subramaniam, and Arvind Varma, Enhanced Aromatic Selectivity during Deoxygenation of Phenolic Model Compounds over Bifunctional Catalysts, *2019 North American Catalysis Society Meeting (NAM26)*, Chicago, Illinois, June 23-28, **2019**.
27. Johnny ZhuChen, Zhenwei Wu, Slgi Choi, Yang Xiao, Arvind Varma, Wei Liu, Guanghui Zhang, and Jeffrey T. Miller, Structure Determination of Nanoscale Pt_3Bi Intermetallic Alloy Catalysts for Non-Oxidative Coupling of Methane and Propane Dehydrogenation, *2019 North American Catalysis Society Meeting (NAM26)*, Chicago, Illinois, June 23-28, **2019**.
26. Yang Xiao and Arvind Varma, A Mechanistic Study of Glycerol Conversion to Aromatic Hydrocarbons over Bifunctional Metal-Supported H-ZSM-5 Catalysts ***(invited talk in honor of Prof. Dan Luss' contributions to the field of chemical reaction engineering)***, *The 4th North American Symposium for Chemical Reaction Engineering (NASCRE 4)*, Houston, Texas, March 10-13, **2019**.
25. Yang Xiao and Arvind Varma, Highly Selective Nonoxidative Coupling of Methane (NOCM) over Pt-Bi Bimetallic Catalysts, *AIChE Annual Meeting*, Pittsburgh, Pennsylvania, October 28 - November 2, **2018**.
24. Arvind Varma and Yang Xiao, Bio-Oil Upgrading Using Methane: A Mechanistic Study of Model Compound Guaiacol Reactions over Pt-Bi Bimetallic Catalysts ***(invited talk in honor of Prof. Doraiswami Ramkrishna' contributions to the field of chemical reaction engineering)***, *AIChE Annual Meeting*, Pittsburgh, Pennsylvania, October 28 - November 2, **2018**.
23. Yang Xiao, Yuan Wang, and Arvind Varma, Methanol Conversion to Formaldehyde at Low Tempera-

tures over Pt-Bi Bimetallic Catalysts, *AIChE Annual Meeting*, Pittsburgh, Pennsylvania, October 28 - November 2, **2018**.

22. Yang Xiao and Arvind Varma, Bimetallic Catalysis for Various Shale Gas and Biomass Conversions, *AIChE Annual Meeting*, Pittsburgh, Pennsylvania, October 28 - November 2, **2018**.
21. Rexonni B. Lagare, Yang Xiao, and Arvind Varma, Direct Catalytic Conversion of Methane to Liquid Oxygenates *CISTAR Biannual Meeting*, Albuquerque, NM, October 3-5, **2018**.
20. Yang Xiao and Arvind Varma, Upgrading Bio-Oil Model Compound over Pt-Based Catalysts: A Comparative Study Using Hydrogen and Methane, *International Symposium on Chemical Reaction Engineering (ISCRE-25)*, Florence, Italy, May 20 - 23, **2018**.
19. Yang Xiao and Arvind Varma, Highly Selective Nonoxidative Coupling of Methane (NOCM) over Pt-Bi Bimetallic Catalysts *The Catalysis Club of Chicago 2018 Spring Symposium*, Chicago, Illinois, May 11, **2018**.
18. Yang Xiao, Yuan Wang, and Arvind Varma, Low-Temperature Selective Oxidation of Methanol to Formaldehyde over Pt-Bi Bimetallic Catalysts, *39th Annual Michigan Catalysis Society Spring Symposium*, Midland, Michigan, May 3, **2018**.
17. Lindsey Blanshan, Yang Xiao, and Arvind Varma, Catalytic Conversion of Biomass Model Compounds to Biofuels over Pt-based Supported Catalysts, *AIChE North Central Regional Conference*, West Lafayette, IN, April 6 - 7, **2018**.
16. Yang Xiao and Arvind Varma, Insight and Applications of Pt-Bi Bimetallic Catalysts: A Combined Experimental and DFT Study, *AIChE Annual Meeting*, Minneapolis, MN, October 29 - November 3, **2017**.
15. Yang Xiao and Arvind Varma, Kinetics of Glycerol Conversion to Hydrocarbon Fuels over Pd/H-ZSM-5 Catalysts, *AIChE Annual Meeting*, Minneapolis, MN, October 29 - November 3, **2017**.
14. Yang Xiao and Arvind Varma, Kinetics of Guaiacol Deoxygenation Using Methane over Pt-Bi Catalyst, *5th North American Catalysis Society Meeting*, Denver, CO, June 4-9, **2017**.
13. Xiaohong Wang, Yang Xiao, and Arvind Varma, Controllable Solution Combustion Synthesis of Nanoscale α / $\beta - Bi_2O_3$ and Its Catalytic Application, *AIChE Annual Meeting*, San Francisco, CA, November 13-18, **2016**.
12. Yang Xiao and Arvind Varma, Glycerol to Hydrocarbon Fuels Via Bifunctional Catalysts, *AIChE Annual Meeting*, San Francisco, CA, November 13-18, **2016**.
11. Yang Xiao and Arvind Varma, Guaiacol Deoxygenation Using Methane over Pt-Bi Catalysts: Reaction Pathways and Kinetics, *AIChE Annual Meeting*, San Francisco, CA, November 13-18, **2016**.
10. Yang Xiao and Arvind Varma, Insight into Pt-Bi Bimetallic Catalysts: An Experimental and DFT Study, *AIChE Annual Meeting*, San Francisco, CA, November 13-18, **2016**.
9. Yang Xiao and Arvind Varma, Insight into Pt-Bi Bimetallic Catalysts for Tuning Selectivity and Improving Stability, *International Symposium on Chemical Reaction Engineering (ISCRE-24)*, Minneapolis, MN, June 12-15, **2016**.

8. Yang Xiao and Arvind Varma, Catalytic Deoxygenation of Guaiacol Using Methane, *AIChE Annual Meeting*, Salt Lake City, UT, November 8-13, **2015**.
7. Yang Xiao, Zhi-Jian Zhao, Jeffrey Greeley, and Arvind Varma, An Experimental and Theoretical Study of Glycerol Selective Oxidation to 1,3-Dihydroxyacetone Via Bimetallic Platinum-Bismuth Catalysts, *AIChE Annual Meeting*, Salt Lake City, UT, November 8-13, **2015**.
6. Yang Xiao, Zhi-Jian Zhao, Jeffrey Greeley, and Arvind Varma, Glycerol Selective Oxidation to 1,3-Dihydroxyacetone via Bimetallic Platinum-Bismuth Catalysts: An Experimental and Theoretical Study, *AIChE 7th Annual Midwest Regional Conference*, Chicago, IL, March 12-13, **2015**.
5. Yang Xiao, Guomin Xiao, and Arvind Varma, Experimental and Simulation Study of a Universal Procedure for Crude Glycerol Purification From Different Feedstocks in Biodiesel Production, *AIChE Annual Meeting*, San Francisco, CA, November 3-8, **2013**.
4. Yang Xiao and Arvind Varma, Experimental and Simulation Study of Crude Glycerol Purification from Different Feedstocks in Biodiesel Production, *246th ACS National Meeting*, Indianapolis, IN, September 8-12, **2013**.
3. Yang Xiao, Haoyang Li, Guomin Xiao, Lijing Gao, and Xiaomei Pan, Simulation of the Catalytic Reactive Distillation Process for Biodiesel Production via Transesterification, *International Conference on Renewable Energy and Environmental Materials*, Beijing, China, May 21-23, **2012**.
2. Lijing Gao, Guomin Xiao, and Yang Xiao, Study on Intrinsic Kinetics of Transesterification Reaction Catalyzed by Solid Base in Fixed Bed Reactor, *The 6th National Conference on Chemical Engineering and Biochemistry*, Changsha, China, October 29-31, **2010**.
1. Yang Xiao, Lijing Gao, Guomin Xiao, and Jianhua Lv, Kinetics of Transesterification Reaction Catalyzed by Solid Base in Fixed Bed Reactor, *International Conference on Chemical and Biological Utilization of Biomass Resources (ICCUB2010)*, Nanjing, China, October 22-26, **2010**.

Professional Services

Service to Academic Program, Research Center, College, and University

Tenure-Track Faculty Search Committee	Chemical Engineering Program	2024-2025
Executive Committee	Institute for Micromanufacturing	2023-2024
Strategic Planning Committee - Research Team	College of Engineering and Science	2024-2025
University Senate (Executive Committee)	Louisiana Tech University	2024-2025

Journal Editorships and Advisory Boards

Catalysts	Guest Editor	2021-present
Int. J. Comput. Mater. Sci. Surf. Eng.	Acting Editor	2021-present
Sustainability	Editorial Board Member	2022-present

Proposal Panelist/Reviewer

Funding Agency:	*Program:*	
National Science Foundation (NSF)	CBET Catalysis	2023
National Science Foundation (NSF)	Major Research Instrumentation	2024

National Science Foundation (NSF)	Trailblazer Impact Award	2024
National Science Foundation (NSF)	Process Systems, Reaction Engineering, and Molecular Thermodynamics	2024
National Science Foundation (NSF)	Environmental Engineering	2025
ACS Petroleum Research Fund (PRF)	Surface Science	2023-2025
Department of Energy (DOE)	Office of Basic Energy Sciences	2023

Conference Sessions Chaired

7. Catalyst Design, Synthesis, and Characterization V: Hydrogenation/Dehydrogenation (session chair), *AIChE Annual Meeting*, Boston, MA, November 2 - 6, 2025.
6. Catalysis on Low Dimensional Materials (bin co-chair, session chair), *AIChE Annual Meeting*, San Diego, CA, October 27 - 31, 2024.
5. Catalysis on Low Dimensional Materials (bin co-chair, session co-chair), *AIChE Annual Meeting*, Orlando, FL, November 5 - 10, 2023.
4. Session III, *Southeastern Catalysis Society Annual Symposium*, Tuscaloosa, AL, February 27 - 28, 2023.
3. Fundamentals of Catalysis and Surface Science II: Zeolites and Acid Catalysis, *AIChE Annual Meeting*, Phoenix, AZ, November 13 - 18, 2022.
2. Biomass Upgrading I: Reaction Fundamentals, *AIChE Annual Meeting*, Boston, MA, November 5 - 11, 2021.
1. Fundamentals and Strategies for Catalytic Biomass Conversion, *AIChE Annual Meeting*, Virtual, November 16 - 20, 2020.

Manuscript Reviewer (over 200 times for more than 40 journals)

ACS Omega, *ACS Nano*, *ACS Sustainable Chemistry & Engineering*, *AIChE Journal*, *Applied Energy*, *Applied Catalysis A: General*, *Applied Surface Science*, *Asia-Pacific Journal of Chemical Engineering*, *Biomass and Bioenergy*, *Biomass Conversion and Biorefinery*, *Catalysis Communications*, *Catalysis Letters*, *Catalysts*, *Chem*, *Chem Catalysis*, *ChemNanoMat*, *Chemical Engineering and Processing: Process Intensification*, *Chemical Engineering Journal*, *Chemical Engineering Science*, *ChemistrySelect*, *ChemCatChem*, *ChemSusChem*, *Chinese Journal of Chemical Engineering*, *ECS Journal of Solid State Science and Technology*, *Energy Exploration & Exploitation*, *Energy & Fuels*, *Fuel Processing*, *Journal of Environmental Chemical Engineering*, *Journal of Sustainable Bioenergy Systems*, *Industrial & Engineering Chemistry Research*, *Korean Journal of Chemical Engineering*, *Materials*, *Materials Chemistry and Physics*, *Molecular Simulation*, *Molecular Physics*, *Molecular Catalysis*, *Molecules*, *Next Research*, *Reactions*, *Reaction Chemistry & Engineering*, *Results in Surfaces and Interfaces*, *Reviews in Chemical Engineering*, *Sustainability*, and *Sustainable Energy & Fuels* .