

NAME: **Che, Fanglin, Ph.D.**

Email: [fcche@wpi.edu](mailto:fcche@wpi.edu)

Department: Chemical Engineering

College: School of Engineering

Rank: Associate Professor

Field: Machine Learning, Multi-Scale Simulation, Multi-Physics Modeling

Applications: Electrocatalysis, Field-Enhanced Chemistry, Plasma Catalysis.

---

## A. EDUCATION AND ACADEMIC QUALIFICATIONS

### 1. Education

Dalian University of Technology, Dalian, Liaoning, China	Chemical Engineering	B.S., 2012
Washington State University, Pullman, WA	Chemical Engineering	Ph.D., 2016
University of Toronto, Toronto, ON, Canada	Electrocatalysis	Postdoc, 17-18
University of Delaware, Newark, DE	Computational Fluid Dynamics	Postdoc, 18-19

### 2. Academic Experience

08/2025 – Present Associate Professor Worcester Polytechnic Institute, Chemical Engineering  
09/2019 – 07/2025 Assistant Professor University of Massachusetts Lowell, Chemical Engineering

## B. PROFESSIONAL ACTIVITIES

### 1. Professional Association Participation

- 1) Panel discussant for the following funding agencies, such as ACS Petroleum Research Fund, Department of Energy, National Science Foundation, and Welch Foundation.
- 2) Session chair/co-chair for conferences, including AIChE Annual Meetings (2018-2025), ACS Spring and Fall Meetings (2020 - 2025), the North American Catalysis Society (2019-2025), A Machine Learning for Energy Materials Discovery Workshop (2018).
- 3) Reviewer for over different journals since 2014, such as Nature Communications, Nature Catalysis, Nature Chemical Engineering, ACS Catalysis, Journal of the American Chemical Society, JACS Au, Joule, and so on. Annual reviews are over 20 articles.

### 2. Professional Honors and Awards (**2023 DOE Early Career**)

- 1) 2025 Oak Ridge Institute for Science and Education (ORISE) fellows.
- 2) 2024 "Global Outstanding Young Female Scientists in Chemistry Award" at GCCES.
- 3) **Department of Energy Early Career Research Award, 2023.**
- 4) Best Researcher Award, International Research Awards on New Science Inventions, 2023.

- 5) Sustainable Publishing Fund Award, 2022.
- 6) University of Massachusetts Lowell Teaching Award, 2021.
- 7) “National Excellent Self-Financed Scholarship for International Students” 2017.
- 8) Catalysis Reaction & Engineering Division Travel Award, 2016 AIChE Meeting, 2016.
- 9) First Place Poster Presentation, AVS Pacific Northwest Chapter, 2016.
- 10) Alaska Airline Travel Award, 2016 AIChE Meeting, 2016.
- 11) University of Illinois at Urbana-Champaign MCC Travel Grant, 2015.
- 12) Kokes Award, 24th NAM Meeting, 2015.

3. Non-Teaching Activities

- Discovery Museum (Acton, Massachusetts) Advisory Council, Science & Engineering Communication Fellows.
- Membership in Professional Societies: ACS, NECS, AICHE, ECS

**C. RESEARCH**

1. Grants & Contracts

- 1) Proposal Title: Physics-Informed Artificial Intelligence Boosted Design of High Entropy Alloys for Plasma-Catalytic Ammonia Cracking. Source of Support: ONR. Dr. Che serves as the PI.

Dr. Che's Total Award Amount: \$413,000; Award Period: 06/01/2025 - 05/31/2027

- 2) Proposal Title: Molecular Dynamics and Group Additivity-Informed AI for Developing Non-PFAS Alternatives. Source of Support: DEVCOM. Dr. Che serves as the PI.

Dr. Che's Total Award Amount: \$314,000; Award Period: 01/01/2025 - 12/31/2026

- 3) Proposal Title: Multi-Scale Model-Informed Deep Learning for Plasma-Nanoparticle Interaction. Source of Support: Department of Energy Fusion Energy Science. This is a single PI award.

Dr. Che's Total Award Amount: \$516,468; Award Period: 09/01/2024 - 08/31/2027

- 4) Proposal Title: Collaborative Research: Physics-Informed Machine Learning for Electrochemical C-N Coupling by Metal-Organic Materials. Source of Support: NSF. This is a collaborative proposal with John Hopkins University. Dr. Che serves as the PI at UMass Lowell.

Dr. Che's Total Award Amount: \$350,000; Award Period: 09/01/2024 - 08/31/2027

- 5) Proposal Title: High-throughput discovery of spinel oxides for natural seawater electrolysis. Source of Support: UL Research Institutes. This is subaward from UMass Amherst. Dr. Che serves as the PI at UMass Lowell.

Total Award: \$600,000 (Dr. Che's Subaward Amount: \$251,842); Award Period: 09/01/2024 - 08/31/2027

- 6) Proposal Title: Machine Learning Guided PFAS-Free Textile. Source of Support: DEVCOM. Role: Co-PI (UML).

Total Award: \$350,000 (Dr. Che's Award Amount: \$119,981); Award Period: 6/15/2024 - 06/14/2026

- 7) Proposal Title: Machine Learning Guided 3D Printing Structure Heating Mechanism. Source of Support: DOE. This is a subcontract from Lawrence Livermore National Laboratory. Dr. Che serves as the PI at UMass Lowell.

Total Award Amount: \$210,000; Award Period: 10/01/2023 - 09/30/2026

- 8) Proposal Title: Interpretable Deep Learning for Advancing Field-Enhanced Catalysis. Source of Support: DOE Early Career. Role: PI.**

**Total Award Amount: \$875,000; Award Period: 07/01/2023 - 06/30/2028**

- 9) Proposal Title: Compact, Low-Cost, Biogas Reformer for 3 kW SOFC Power Generator. Source of Support: Army. This is a subcontract from Aspen Products Group Inc. Dr. Che serves as the PI at UMass Lowell.

Total Award Amount: \$170,000 (Dr. Che's Subaward Amount: \$52,381); Award Period: 09/30/2022 - 05/15/2023

- 10) Proposal Title: CO<sub>2</sub> Conversion for Temporally Controlled Hydrogen Storage and Electricity Generation. Source of Support: ONR. Role: Co-PI.

Total Award Amount: \$510,000 (Dr. Che's Award Amount: \$82,892); Award Period: 09/26/2022 - 09/25/2025

- 11) Proposal Title: Renewably-Powered CO<sub>2</sub> Recycling for Zero-Carbon On-Demand Fuel Generation. Source of Support: ONR. Role: Co-PI.

Total Award Amount: \$290,000 (Dr. Che's Award Amount: \$145,000); Award Period: 11/31/2021 - 11/30/2024

- 12) Proposal Title: Tunable Plasma Catalytic Reactor for On-Demand Ammonia Production. Source of Support: ONR. Role: Co-PI.

Total Award Amount: \$290,000 (Dr. Che's Award Amount: \$96,667); Award Period: 10/01/2021 - 11/30/2024

- 13) Proposal Title: EAGER: Electrocatalysis Modulated by Bifunctional Organic Monolayer: CO<sub>2</sub> Reduction to C<sub>2</sub>. Source of Support: NSF. Role: PI.

Total Award Amount: \$290,482; Award Period: 03/15/2021 - 02/28/2024

- 14) 11 awarded Computational Resources at ACCESS (SDSC, FASTER, DARWIN, TACC), ORNL-CNMs, and NERSC with ~4,640,000.0 cpu hours and 12,000 gpu hours. Role: PI.

Estimated Total Award Amount: \$180,285; Award Period: 10/01/2020 - 06/30/2025

2. Academic & Professional Publications with Impact Factor (IF)

Citations: 5752. h-index: 27. i10-index: 36. By 08/05/2025 from [Google Scholar](#)

- 1) (Corresponding Author) P. Singh, Q. Li, Y. Liu, **F. Che\***, Multiscale Simulation Guided Electric Field-Enhanced Ammonia Catalytic Cracking, *ACS Catal.*, 2025, DOI: 10.1021/acscatal.5c01829, IF: 11.5
- 2) (Corresponding Author) S. A. Ibrahim, S. Meng, C. Milhans, M. H. Barecka, Y. Liu, Q. Li, J. Yang, Y. Sha, Y. Yi, **F. Che\***, Interpretable Machine Learning Guided Plasma Catalysis for Hydrogen Economy, Accepted by *Nature Chemical Engineering*, NATCHEMENG-24051015B, 2025.
- 3) (Corresponding Author) R. Zhao, Q. Li, J. Yang, C. Zhu, **F. Che\***, Integrating Physical Principles with Machine Learning for Predicting Field-Enhanced Catalysis, *JACS Au*, 2025, DOI: 10.1021/jacsau.4c00901. IF: 8.5
- 4) (Corresponding Author) R. Nankya, Y. Xu, A. Elgazzar, P. Zhu, T.U. Wi, C. Qiu, Y. Feng, **F. Che\***, H. Wang\*. Cobalt-Doped Bismuth Nanosheet Catalyst for Enhanced Electrochemical CO<sub>2</sub> Reduction to Electrolyte-Free Formic Acid, *Angewandte Chemie International Edition*, 2024, e202403671. IF: 16.6
- 5) A. Garzon, S. Wang, A. Omoniyi, L. Tam, **F. Che**, AJR. Hensley. Temperature and pressure driven functionalization of graphene with hydrogen and oxygen via ab initio phase diagrams, *Applied Surface Science*, 2024, 161053. IF: 6.7
- 6) (Corresponding Author) L. Fang, M. Wan, Y. Liu, B. Reinhart, Z. Jin, M. Yang, **F. Che\***, T. Li\*. Revealing Structural Evolution of Single Atom Catalysts during Electrochemical CO<sub>2</sub> Reduction by in Situ X-ray Absorption Spectroscopy, *ACS Materials Letters*, 2024, 6, 3343. IF: 10.2
- 7) (Corresponding Author) Y. Wang, R. Zhao, K. G Rappé, Y. Wang, **F. Che\***, F. Gao\*. Mechanisms and site requirements for NO and NH<sub>3</sub> oxidation on Cu/SSZ-13, *Applied Catalysis B: Environmental and Energy*, 2024, 346, 123726. IF: 24.319
- 8) (Corresponding Author) Y. Xu, **F. Che\***. Beyond post-C-C coupling in CO<sub>2</sub> electroreduction, views and news, *Nature Chemical Engineering*, 2024, 1(2), 134-135.
- 9) (Corresponding Author) Z. Jin, Y. Xu, M. Chhetri, J. Wood, B. Torreon, **F. Che\***, M. Yang. Recent Developments of Single Atom Alloy Catalysts for Electrocatalytic Hydrogenation Reactions, *Chemical Engineering Journal*, 2024, 491, 152072. IF: 16.744
- 10) (Corresponding Author) M. E. King, Y. Xu, N. L. Mason, P. Nagarajan, **F. Che\***, M. B. Ross\*, Leveraging Bismuth Immiscibility to Create Highly Concave Noble Metal Nanoparticles, *Chem*, 2024, 10, 1-16. IF: 25.83
- 11) (Corresponding Author) X. Yu, Y. Xu, L. Li, M. Zhang, W. Qin, **F. Che\***, M. Zhong\*, Coverage Enhancement Accelerates Acidic CO<sub>2</sub> Electrolysis at Ampere-Level Current with High Energy and Carbon Efficiencies, *Nat. Commun.*, 2024, 15 (1), 1711. IF: 16.383
- 12) (Corresponding Author) C. S. Gerke<sup>†</sup>, Y. Xu<sup>†</sup>, Y. Yang, G. D. Foley, B. Zhang, E. Shi, N. M. Bedford, **F. Che\***, V. S. Thoi\*, *J. Am. Chem. Soc.*, Electrochemical C-N Bond Formation Within Boron Imidazolate Cages Featuring Single Copper Sites, 2023, 145, 48, 26144–26151. IF: 16.383
- 13) (Corresponding Author) Y. Xu, M. Ross, H. Xin, **F. Che\***, Engineering Bimetallic Interface and

- Revealing the Mechanism for CO<sub>2</sub> Electroreduction Reaction to C<sub>3+</sub> Liquid Chemicals, *Cell Rep. Phys. Sci.*, 2023, 4 (12), 101718. IF: 8.42
- 14) (Corresponding Author) M. Wan, Z. Yang, H. Morgan, J. Shi, F. Shi, M. Liu, H.-W. Wong, Z. Gu\*, and **F. Che\***, Enhanced CO<sub>2</sub> Reactive Capture and Conversion Using Aminothiolate Ligand–Metal Interface, *J. Am. Chem. Soc.*, 2023, 145 (48), 26038-26051. IF: 16.383. Featured as the front cover. <https://pubs.acs.org/toc/jacsat/145/48>
- 15) M. Schreier, P. Kenis, **F. Che**, S. Anthony, Trends in electrocatalysis: The microenvironment moves to center stage, *ACS Energy Letters*, 2023, 8, 9, 3935-3940. IF: 23.991
- 16) (Corresponding Author) Z. Yang<sup>†</sup>, M. Wan, Z. Gu\*, **F. Che\***, CO<sub>2</sub>RR-to-CO enhanced by SAM and Ag catalytic interface, *J. Phys. Chem. C*, 2023, 127, 36, 17685–17693. IF: 4.177
- 17) (Corresponding Author) M. Chhetri<sup>†</sup>, M. Wan<sup>†</sup>, Z. Jin<sup>†</sup>, J. Yeager, C. Sandor, D. Takyi Sekyere, C. Rapp, H. Wang, S. Lee, C. Bodenschatz, M. J. Zachman, **F. Che\***, M. Yang\*, Atomically Dispersed PGMs Assisted Copper as a Dual-Site Catalyst to Boost Hydrocarbon Formation in Electrocatalytic CO<sub>2</sub> Reduction, *Nat. Commun.*, 14, 3075, 2023. IF: 17.694
- 18) (Corresponding Author) S. Brown, S. A. Ibrahim, B. R. Robinson, S. Tiwari, D. Bhattacharyya, Y. Wang, **F. Che\***, J. Hu\*, Ambient carbon-neutral ammonia generation via a cyclic microwave plasma process, *ACS Appl. Mater. Interfaces*, 2023, 15, 23255. IF: 10.383
- 19) (Corresponding Author) S. Tiwari<sup>†</sup>, S. A. Ibrahim<sup>†</sup>, B. Robinson, S. Brown, Q. Wang, **F. Che\***, J. Hu\*, Post-plasma catalysis: Charge effect on product selectivity in conversion of methane and nitrogen plasma to ethylene and ammonia, *Catal. Sci. Technol.*, 13, 2966, 2023. IF: 6.177
- 20) T. Mou<sup>†</sup>, H. S. Pillai<sup>†</sup>, S. Wang<sup>†</sup>, M. Wan, X. Han, N. M. Schweitzer, **F. Che**, H. Xin,\* "Bridging the complexity gap in computational heterogeneous catalysis with machine learning", *Nat. Catal.*, 2023, 6 (2), 122 - 136. IF: 40.71
- 21) (Corresponding Author) M. Wan<sup>†</sup>, H. Yue<sup>†</sup>, J. Notarangelo, H. Liu, **F. Che\***, "Deep-Learning Assisted Electric Field-Accelerated Ammonia Synthesis", *JACS Au*, 2022, 2, 1338. ACS Editor's Choice. Invited Front Cover. IF: 8.0
- 22) (Corresponding Author) M. Wan, Z. Gu, **F. Che\***, Hybrid Organic-Inorganic Heterogeneous Interfaces Modulated Electrocatalysis: A Theoretical Study of CO<sub>2</sub> Reduction to C<sub>2</sub>. *ChemCatChem*, 2022, 14 (4), e202200054. Invited Front Cover. IF: 5.501
- 23) (Corresponding Author) J. Li<sup>†</sup>, A. Ozden<sup>†</sup>, M. Wan<sup>†</sup>, Y. Hu, Z. Wang, Y. Wang, Y. Xu, D.-H. Nam, J. Wicks, B. Chen, X. Wang, F. Li, M. Graetzel, **F. Che\***, E. H. Sargent\* & D. Sinton\*, Silica-copper catalyst interfaces enable carbon-carbon coupling towards ethylene electrosynthesis. *Nat. Commun.*, 2021, 12, 2808. IF: 17.694

Above 23 Publications are independent works

- 24) N. Ulumuddin, **F. Che**, J. Yang, S. Ha, J.-S. McEwen, Elucidating the Influence of Electric Fields Toward CO<sub>2</sub> Activation on YSZ (111), *Catalysts*, 11, 271. IF: 4.501
- 25) M. Zhong, K. Tran, Y. Min, C. Wang, Z. Wang, C.-T. Dinh, P. Luna, Z. Yu, Armin Sedighian Rasouli, Peter Brodersen, Song Sun, Oleksandr Voznyy, Chih-Shan Tan, Mikhail Askerka, **F. Che**, Min Liu, Ali Seifitokaldani, Yuanjie Pang, Shen-Chuan Lo, Alexander Ip, Zachary Ulissi, Edward H Sargent, Accelerated discovery of CO<sub>2</sub> electrocatalysts using active machine learning, *Nature*, 2020, 7807, 178. IF: 69.504

- 26) (Co-first Author) Q. Bkour<sup>‡</sup>, **F. Che<sup>‡</sup>**, K.-M. Lee, C. Zhou, N. Akter, J. A. Boscoboinik, K. Zhao, J. Gray, S. R. Saunders, M. G. Norton, J.-S. McEwen, T. Kim, S. Ha\*, Enhancing the partial oxidation of gasoline with Mo-doped Ni catalysts for SOFC applications: An integrated experimental and DFT study, *Appl. Catal. B*, 2020, 226, 118626. IF: 24.319
- 27) S. Hu, **F. Che**, B. Khorasani, M. Jeon, C. Yoon, J.-S. McEwen, L. Scudiero, S. Ha, Improving the electrochemical oxidation of formic acid by tuning the electronic properties of Pd-based bimetallic nanoparticles, *Appl. Catal. B*, 2019, 254, 685-692. IF: 24.319
- 28) J. T. Gray, **F. Che**, J.-S. McEwen, S. Ha, Coke resistance at the flip of a switch, *Appl. Catal. B*, 2019, 118132. IF: 24.319
- 29) (Co-first Author) Y. Kim<sup>‡</sup>, **F. Che<sup>‡</sup>**, J. Jo<sup>‡</sup>, J. Choi<sup>‡</sup>, P. Arquer, O. Voznyy, B. Sun, J. Kim, M.-J. Choi, R. Quintero-Bermudez, F. Fan, C.S. Tan, E. Bladt, G. Walters, A. Proppe, C. Zou, H. Yuan, S. Bals, J. Hofkens, M. Roeloffs, S. Hoogland, E. H. Sargent, A facet-specific quantum dot passivation strategy for colloid management and efficient infrared photovoltaics, *Adv. Mater.*, 2019, 31 (17), 1805580. IF: 29.4
- 30) (Co-first Author) M. Liu<sup>‡</sup>, **F. Che<sup>‡</sup>**, Bin Sun, O. Voznyy, A. Proppe, R. Munir, M. Wei, R. Quintero-Bermudez, L. Hu, S. Hoogland, A. Mandelis, A. Amassian, S.O. Kelley, P. Arquer, E. H. Sargent, Controlled steric hindrance enables efficient ligand exchange for stable, infrared-bandgap quantum dot inks. *ACS Energy Lett.*, 2019, 4, 6, 1225-1230. IF: 23.991
- 31) (Co-first Author) J. Li<sup>‡</sup>, **F. Che<sup>‡</sup>**, Y. Pang<sup>‡</sup>, C. Zou<sup>‡</sup>, J. Howe, T. Burdyny, J. Edwards, Y. Wang, F. Li, Z. Wang, P. Luna, C. Dinh, T.-T. Zhuang, M. Saidaminov, S. Cheng, T. Wu, Y. Finck, L. Ma, S.-H. Hsieh, Y.-S. Liu, G. Botton, W.-F. Pong, X. Du, J. Guo, T.-K. Sham, E. H. Sargent, D. Sinton, Adparticle-enabled electrosynthesis of n-propanol from carbon monoxide, *Nat. Commun.*, 2018, 9 (1), 4614. IF: 17.694
- 32) (Co-first Author) Y. Zhou<sup>‡</sup>, **F. Che<sup>‡</sup>**, M. Liu<sup>‡</sup>, C. Zou, Z. Liang, P. Luna, H. Yuan, J. Li, Z. Wang, H. Xie, H. Li, P. Chen, E. Bladt, R. Quintero-Bermudez, T.-K. Sham, S. Bals, J. Hofkens, D. Sinton, G. Chen, E. H. Sargent, Dopant-induced electron localization drives CO<sub>2</sub> reduction to C<sub>2</sub> hydrocarbons. *Nat. Chem.*, 10, 974–980, 2018. Impact Factor: 21.687
- 33) J. Bray, A. Hensley, G. Collinge, **F. Che**, Y. Wang, J.-S. McEwen, Modeling the adsorbate coverage distribution over a multi-faceted catalytic grain in the presence of an electric field: O/Fe from first principles, *Catal. Today*, 2018, 312, 92-104. IF: 6.562
- 34) (Co-first Author) H. Tan<sup>‡</sup>, **F. Che<sup>‡</sup>**, M. Wei<sup>‡</sup>, Y. Zhao, M. Saidaminov, P. Todorović, D. Broberg, G. Walters, F. Tan, T. Zhuang, B. Sun, Z. Liang, H. Yuan, E. Fron, J. Kim, Z. Yang, O. Voznyy, M. Asta, E. H. Sargent, Dipolar cations confer defect tolerance in wide-bandgap metal halide perovskites, *Nat. Commun.*, 9, 3100, 2018. IF: 17.694
- 35) T. Zhuang<sup>‡</sup>, Z. Liang<sup>‡</sup>, A. Seifitokaldani<sup>‡</sup>, Y. Li, P. D. Luna, T. Burdyny, **F. Che**, F. Meng, Y. Min, R. Quintero-Bermudez, C. T. Dinh, Y. Pang, M. Zhong, B. Zhang, J. Li, P. Chen, X. Zheng, H. Liang, W. Ge, B. Ye, D. Sinton, S. Yu, E. H. Sargent, Steering post-C–C coupling selectivity enables high efficiency electroreduction of carbon dioxide to multi-carbon alcohols, 2018, *Nat. Catal.*, 1, 421. IF: 40.71
- 36) **F. Che**, J. T. Gray, S. Ha, N. Kruse, S. L. Scott, J.-S. McEwen, Elucidating the Roles of the Electric Fields in Catalysis: A Perspective. *ACS Catal.*, 8, 5153–5174, 2018. IF: 12.9
- 37) **F. Che**, J. T. Gray, S. Ha, J.-S. McEwen, Reducing Reaction Temperature, Steam Requirements, and Coke Formation During Methane Steam Reforming Using Electric Fields: A Microkinetic

Modeling and Experimental Study. *ACS Catal.*, 7, 6957-6968, 2017. IF: 12.9

- 38) **F. Che**, S. Ha, J.-S. McEwen, Oxidation State Controlled Catalytic Reaction Rates: A Case Study of the C-H Bond Cleavage in Methane over Ni-Based Catalysts, *Angew. Chem., Int. Ed.*, 129, 3611, 2017. Selected as the cover art and a hot paper. IF: 16.6
- 39) **F. Che**, S. Ha, J.-S. McEwen, Strategies for Enhancing the Stability of Oxygen Enriched Ni/YSZ Catalysts: A Field-Dependent Microkinetic Model, Invited Manuscript, *Ind. Eng. Chem. Res.*, 56, 1201-1213, 2017. Selected as the cover art. IF: 4.2
- 40) **F. Che**, J. T. Gray, S. Ha, J.-S. McEwen, Improving Ni Catalysts Using Electric Field: A DFT and Experimental Study of the Methane Steam Reforming Reaction, *ACS Catal.*, 7, 551-562, 2017. IF: 12.9
- 41) **F. Che**, S. Ha, J.-S. McEwen, Mitigating the Role of the Electric Field at the Ni/YSZ Anode: A DFT study, *J. Phys. Chem. C*, 120, 14608-14620, 2016. Selected as the cover art. IF: 4.177
- 42) **F. Che**, S. Ha, J.-S. McEwen, Elucidating the Field Influence on the Methane Steam Reforming Reaction: A Density Functional Theory Study, *Appl. Catal. B*, 195, 77-89, 2016. IF: 24.319
- 43) **F. Che**, J. T. Gray, S. Ha, J.-S. McEwen, Catalytic Water Dehydrogenation and Formation on Nickel: Dual Path Mechanism in High Electric Fields, *J. Catal.*, 332, 187-200, 2015. IF: 8.047
- 44) **F. Che**, A. J. Hensley, S. Ha, J.-S. McEwen, Decomposition of Methyl Species on Ni(211): Investigations of the Electric Field Influence, *Catal. Sci. Technol.*, 4, 4020-4035, 2014. IF: 6.177
- 45) **F. Che**, R. Zhang, A. J. Hensley, S. Ha, J.-S. McEwen, Density Functional Theory Studies of Methyl Dissociation on a Ni(111) Surface in the Presence of an External Electric Field. *Phys. Chem. Chem. Phys.*, 16, 2399-2410, 2014. IF: 3.945

### 3. Other Research or Creative Activities

- 46) Patent 1: Younghoon Kim, **Fanglin Che**, JeaWoong Jo, Jongmin Choi, Garcia de Arquer Francisco, Pelayo, Hoogland Sjoerd, Sargent Edward, Facet-selective passivation of nanocrystals and its application to optoelectronic devices. Disclosure Date: May 01 2018, Disclosure No:10003668, University of Toronto Office of the vice-president research and innovation.
- 47) Patent 2: Edward Sargent, Phil De Luna, **Fanglin Che**, Yansong Zhou, Boron-doped copper catalysts for efficient conversion of CO<sub>2</sub> to Multi-carbon Hydrocarbons and associated methods, April 24, 2018, United States, ROBIC Ref. 017978-0023

## D. INSTRUCTION RELATED ACTIVITY

### 1. Teaching

- 1) Graduate: CHEN5390 Mathematics Methods for Engineers, 2019 – 2024 (Fall Semester).
- 2) Undergraduate: CHEN 3170 Computational Methods in Chemical Engineering, 2025 Spring
- 3) Undergraduate: CHEN2020 Introduction to Chemical Engineering Thermodynamics, Spring 2020, Spring 2024.
- 4) Undergraduate: Phase and Reaction Equilibrium, 2021 – 2023 (Spring Semester)

2. Other Activity and Accomplishments Related to the Instructional Function

- 1) Immersive Scholar Program to promote undergraduate students, In particular for underrepresented minorities, female engineers, to be involved in the research.
- 2) Open House Participants to increase the department enrollment
- 3) Discovery Museum (Acton, Massachusetts) Advisory Council, Science & Engineering Communication Fellows.

**E. SERVICE ACTIVITIES**

1. Community Activities Related to Professional Field (16 Invited Department Seminar Talks, 28 Invited Talks at National Conferences, 68 Oral Presentations, 12 Chairs & Organizers for National Conferences)

- 1) Department Seminar Talks: University of Connecticut, Kansas State University, Northwestern University, John Hopkins University, New York Universities, UMass Amherst, Auburn University, Syracuse University, Worcester Polytechnic Institute, University of South Florida, University of Central Florida, Tufts University, Northeastern University, Rice University (invited lecture), University of Delaware (invited lecture), Washington State University, Boston College, University of Colorado Boulder.
- 2) Conferences: 2021 – 2025 NECS winter and spring symposium, 2024 - 2025 ULRI symposiums, 2023 - 2025 DOE PI meetings, 2024 AIMED workshop, 2024 - 2025 APRA-E IGNITTE Finalists, 2016 – 2025 AIChE, 2020 – 2025 ACS Spring and Fall meetings, 2023 ACS Northeast Regional Meeting, Catalysis Society of Metropolitan New York, Research Cloud, Catalysis Society of New York Spring Symposium, Machine Learning for Energy Materials Discovery Workshop, North American Catalysis Meetings, International AVS 64th Meeting, The New England Catalysis Society.
- 3) Leaderships: 12 Chairs and Organizers for AIChE, North American Catalysis Meetings, ACS.

2. Committee Activities

Since September 2019, I have served as committee members for 5 Ph.D thesis, 9 Ph.D. proposal defense, and 6 Ph.D. qualify exams.

3. Other Service to the University

Since September 2019, I have recruited 4 postdoctoral fellows, 5 Ph.D. students, and 5 undergraduate students. In addition, three students have won **Kokes** at the North American Catalysis Meeting and two students have won American Institute of Chemical Engineers (AIChE) Catalysis and Reaction Engineering (CRE) **travel awards**, three student has won the NECS spring symposium poster awards, and one student has won **AIChE conference grant**. *I have graduated one Ph.D. student, Dr. Mingyu Wan in 2024 Spring, who has won 2024 Outstanding Graduate Student Award in Chemical Engineering department at UMass Lowell and is currently hired as an assistant professor at Wuhan University of Science and Technology.*