

# Adam Holewinski

Dept. of Chemical & Biological Eng.  
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## Education

- 2013 Ph.D., Chemical Engineering, University of Michigan, Ann Arbor  
2007 B.S.E. Chemical Engineering, University of Michigan, Ann Arbor

## Professional experience

- 2023— Associate Professor, Department of Chemical and Biological Engineering,  
University of Colorado – Boulder  
2023-24 Visiting Associate Professor, Department of Physics,  
Technical University of Denmark  
2015-23 Assistant Professor, Department of Chemical and Biological Engineering,  
University of Colorado - Boulder  
2014-15 Postdoctoral Fellowship, Georgia Institute of Technology (advisor Chris Jones)  
2007-13 Graduate Researcher, University of Michigan (advisor Suljo Linic)  
2007 Internship, BP Refinery - Controls Group (Toledo, OH)  
2006 Internship, Pfizer R&D - Process Safety Lab (Ann Arbor, MI)

## Awards

- 2023 Fulbright U.S. Scholar (Host Institution: Technical University of Denmark)  
2023 Journal of Catalysis Early Career Board  
2022 CU Boulder Provost's Faculty Achievement Award  
2022 CU College of Engineering Dean's Performance Award -- Outstanding Junior Faculty  
2020 RCSA Scialog Fellow: Negative Emissions Science  
2020 Class of Influential Researchers: *Industrial & Engineering Chemistry Research*  
2019 NSF CAREER Award, CBET Catalysis Program  
2016 Outstanding Graduate Teaching Faculty Award, ChBE Dept., CU Boulder  
2013 Michigan Catalysis Society Outstanding Student Presentation Award  
2013 North American Catalysis Society Kokes Travel Award  
2012 University of Michigan Chemical Engineering Graduate Symposium Poster Award  
2010 AIChE Catalysis and Reaction Engineering Division Poster Award  
2007 National Science Foundation Graduate Research Fellowship - Honorable Mention  
2006 Clifton S. Goddin Prize for Outstanding Chemical Engineering Student (U. Michigan)  
2004-07 University of Michigan Engineering Scholarship of Honor

## Publications

*Refereed articles:* \* =APH Corresponding ; Underline = APH Advisee, °(G), #(UG), %(PD), ‡Equal Contrib.

*Independent Career:* A=article, R=review, P=perspective

1. Hasse, J., ° Manyé Ibáñez, M., ° and Holewinski, A.\* "Impact of electrolyte composition on bulk electrolysis of furfural over platinum electrodes" *ChemCatChem* (2023), 15, 1-9 (IF=5.5) (A)
2. Ramos, N.C., ° Manyé Ibáñez, M., ° Mittal, R., ° Janik, M.J., and Holewinski, A.\* "Combining Renewable Electricity and Renewable Carbon: Understanding Reaction Mechanisms of Biomass-Derived Furanic Compounds for Design of Catalytic Nanomaterials" *Accounts of Chemical Research* (2023) 56, 2631–2641. (IF=24.5) (R)
3. Lucas, F. W. S., ° Schwartz, D. K., Medlin, J.W. and Holewinski, A.\* "Understanding Reactivity of Self-Assembled Monolayer-Coated Electrodes: SAM-Induced Surface Reconstruction" *Electrochimica Acta* (2023), 459, 142586. (IF=7.3) (A)
4. Holewinski, A.\* "Hydride transfer gets a recharge" *Nature Catalysis* (2023), 6, 296-297. (IF=40.7) (P)

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5. [Al Khulaifi, F.M.](#),<sup>o</sup> [Alsunni, Y.A.](#), [Musgrave, C.B.](#), [Holewinski, A.\\*](#), and [Medlin, J.W.\\*](#) “Impact of pretreatment and thiol modifiers on the selective oxidation of glutaraldehyde using Pd/Al<sub>2</sub>O<sub>3</sub>.” *Applied Catalysis A: General* (2023), 119229. (IF=5.7) (A)
6. [Ramos, N. C.](#),<sup>o</sup> [Medlin, J.W.\\*](#) and [Holewinski, A.\\*](#) “Electrochemical stability of thiolate self-assembled monolayers on Au, Pt, and Cu.” *ACS Applied Materials and Interfaces* (2023), 15, 14470-14480. (IF=10.4) (A)
7. [Delluva, A. A.](#),<sup>o</sup> [Kulberg-Savercool, J.#](#) [Holewinski, A.\\*](#) “Thermal Enhancement of Product Conductivity Permits Deep Discharge in Solid State Li-O<sub>2</sub> Batteries” *ACS Applied Energy Materials* (2022) 5, 14739-14747. (IF=7.0) (A)
8. [Baz, A.](#),<sup>o</sup> [Lyons, M.,#](#) and [Holewinski, A.\\*](#) “Dynamic Electrocatalysis: Examining Resonant Catalytic Rate Enhancement Under Oscillating Electrochemical Potential” *Chem Catalysis* (2022) 2, 3497-3516. (A)
9. [Hasse, J.](#),<sup>o</sup> [Agrawal, N.](#), [Janik, M.J.](#), & [Holewinski, A.\\*](#) “ATR-SEIRAS Investigation of the Electro-oxidation Mechanism of Biomass-Derived C<sub>5</sub> Furanics on Platinum Electrodes” *Journal of Physical Chemistry C*, (2022). 126. (IF=4.2) (A)
10. [Baz, A.](#),<sup>o</sup> [Dix, S.T.](#), [Holewinski, A.](#), [Linic, S.](#) “Microkinetic Modeling in Electrocatalysis: Applications, Limitations, and Recommendations for Reliable Mechanistic Insights.” *Journal of Catalysis*, (2021) 404, 864-872. (IF=8.0) (P)
11. [Lucas, F. W. S.](#),<sup>o</sup> [Fishler, Y.](#),<sup>o</sup> [Holewinski, A.\\*](#) “Tuning the Selectivity of Electrochemical Levulinic Acid Reduction to 4-Hydroxyvaleric Acid: A Monomer for Biocompatible and Biodegradable Plastics.” *Green Chemistry*, (2021) 23, 9154-9164 (IF=11.0) (A)
12. [Spivey, T.](#),<sup>o</sup> and [Holewinski, A.\\*](#) “Selective interactions between free-atom-like *d*-states in single-atom-alloy catalysts and near-frontier molecular orbitals.” *Journal of The American Chemical Society*, (2021). 143, 11897-11902. (IF=16.4) (A)
13. [Delluva, A. A.](#),<sup>o</sup> [Kulberg-Savercool, J.#](#) [Holewinski, A.\\*](#) “Decomposition of trace Li<sub>2</sub>CO<sub>3</sub> at high charging potentials leads to cathode interface degradation with the solid electrolyte LLZO.” *Advanced Functional Materials* (2021) 2103716. (IF=19.9) (A)
14. [Baz, A.](#),<sup>o</sup> and [Holewinski, A.\\*](#) Predicting macro-kinetic observables with generalized degrees of rate control in electrocatalysis *Journal of Catalysis* (2021) 397, 233-244. (IF=8.0) (A)
15. [Lucas, F. W. S.](#),<sup>o</sup> [Grim, G.](#), [Hasse, J.](#),<sup>o</sup> [Downes, C.](#) [Roman, A.](#),<sup>o</sup> [Tacey, S.](#), [Farberow, C.](#), [Schaidle, J.\\*](#) & [Holewinski, A.\\*](#) “Electrochemical routes for the valorization of biomass-derived feedstocks: From chemistry to application.” *ACS Energy Letters* (2021). 6, 1205-1270. (IF=24.0) (R)
16. [Harris, A.](#), [Roy, S.](#), [Ganguly, S.](#), [Parameswar, A.](#), [Lucas, F. W. S.](#),<sup>o</sup> [Holewinski, A.](#), [Goodwin, A.](#), & [Cha, J.](#) “Investigating the use of conducting oligomers and redox molecules in CdS-MoFeP biohybrids.” *Nanoscale Advances* (2021). 3, 1392-1396. (IF=5.6) (A)
17. [Roman, A.](#),<sup>o</sup> [Spivey, T.](#),<sup>o</sup> [Medlin, J. W.](#) & [Holewinski, A.\\*](#) “Accelerating electro-oxidation turnover rates via potential-modulated stimulation of electrocatalytic activity” *Industrial and Engineering Chemistry Research* (2020). 59, 19999-200010. (IF=4.3) (A)
18. [Lei, Z.‡](#), [Lucas, F.W.S.‡,‡](#),<sup>o</sup> [Moya, E.](#), [Huang, S.](#), [Rong, Y.](#), [Wesche, A.](#), [Li, P.](#), [Bodkin, L.](#), [Jin, Y.](#), [Holewinski, A.\\*](#), & [Zhang, W.\\*](#), “Highly stable dioxin-linked metallophthalocyanine covalent organic frameworks” *Chinese Chemical Letters* (2021). 32, 3799-3802. (IF=8.5) (A)
19. [Roman, A.](#),<sup>o</sup> [Hasse, J.](#),<sup>o</sup> [Agrawal, N.](#), [Janik, M.J.](#), [Medlin, J. W.](#) & [Holewinski, A.\\*](#) “Electro-oxidation of furfural on gold is limited by fluoride self assembly.” *Journal of Catalysis* (2020). 391, 327-335. (IF=8.0) (A)
20. [Delluva, A.](#),<sup>o</sup> [Dudoff, J.](#),<sup>o</sup> [Teeter, G.](#), & [Holewinski, A.\\*](#) “Cathode interface compatibility of amorphous LiMn<sub>2</sub>O<sub>4</sub> (LMO) and Li<sub>7</sub>La<sub>3</sub>Zr<sub>2</sub>O<sub>12</sub> (LLZO) characterized with thin film electrochemical cells” *ACS Applied Materials and Interfaces* (2020) 12, 24992-24999. (IF=10.4) (A)
21. [Barton, Z.](#),<sup>o</sup> [Garret, G.](#),<sup>o</sup> [Kurtyka, N.](#),<sup>#</sup> [Spivey, T.](#),<sup>o</sup> [Schaidle, J.](#) & [Holewinski, A.\\*](#) “Electrochemical reduction selectivity of crotonaldehyde on copper” *J. Applied Electrochemistry* (2020) 51, 5-17. (IF=2.8) (A)
22. [Baz, A.](#),<sup>o</sup> & [Holewinski, A.\\*](#) “Understanding the interplay of bifunctional and electronic effects: Microkinetic modeling of the CO electrooxidation reaction” *Journal of Catalysis* (2020). 384 1-13.

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- (IF=8.0) (A)
23. Mark, L., Agrawal, N., Roman, A.,<sup>o</sup> Holewinski, A., Janik, M. J., & Medlin, J. W. "Insight into the oxidation mechanism of furanic compounds on Pt(111)" *ACS Catalysis* (2019). 9 11360-11370. (IF=13.7) (A)
  24. Roman, A.,<sup>o</sup> Hasse, J.<sup>o</sup> Medlin, J. W. & Holewinski, A.\* "Elucidating Acidic Electro-Oxidation Pathways of Furfural on Platinum" *ACS Catalysis* (2019). 9, 10305-10316. (IF=13.7) (A)
  25. Gong, L., Agrawal, N., Roman, A.,<sup>o</sup> Holewinski, A. & Janik, M. J. "Density functional theory study of furfural electrochemical oxidation on the Pt (111) surface" *Journal of Catalysis* (2019). 373, 322-335. (IF=8.0) (A)
  26. Wang, L., Holewinski\*, A., & Wang, C\*. "Prospects of platinum-based nanostructures for the electrocatalytic reduction of oxygen" *ACS Catalysis* (2018). 8, 9388-9398. (IF=13.7) (P)
  27. Roman, A.,<sup>o</sup> Dudoff, J.,<sup>o</sup> Baz, A.,<sup>o</sup> Holewinski, A.\* "Identifying "optimal" electrocatalysts: impact of operating potential and charge transfer model" *ACS Catalysis* (2017). 7, 8641-8652. (IF=13.7) (P)

## *Prior to Independent Career:*

28. Holewinski, A., Sakwa-Novak, M., Carillo, J.M., Potter, M., Ellebracht, N., Rother, G., Sumpter, B., Jones, C. W. "Aminopolymer mobility and support interactions in silica-PEI composites for CO<sub>2</sub> capture applications: A quasielastic neutron scattering study" *Journal of Physical Chemistry B*, (2017). 121, 6721-6731. (IF=3.0)
29. Carillo, J.M. , Sakwa-Novak, M., Holewinski, A., Potter, M., Rother, G., Jones, C.W., and Sumpter, B. "Unraveling the dynamics aminopolymer/silica composites" *Langmuir*, (2016). 32, 2617-2625. (IF=3.9) (A)
30. Holewinski, A., Sakwa-Novak, M., and Jones, C. W. "Linking CO<sub>2</sub> sorption performance to polymer morphology in aminopolymer/silica composites through neutron scattering" *Journal of The American Chemical Society*, (2015). 137, 11749-11759. (IF=16.4) (A)
31. Sakwa-Novak, M., Holewinski, A., Hoyt, C., Yoo, C., Chai, S., Dai, S., Jones, C.W. "Probing the role of Zr addition vs. textural properties in enhancement of CO<sub>2</sub> adsorption performance in silica/PEI composite sorbents" *Langmuir*, (2015). 31, 9356-9365. (IF=3.9) (A)
32. Holewinski, A., Idrobo, J-C., and Linic, S. "High performance Ag-Co alloy catalysts for electrochemical oxygen reduction." *Nature Chemistry*, (2014). 6, 828-834. (IF=23.2) (A)
33. Holewinski, A., Xin, H., Nikolla, E., and Linic, S. "Identifying optimal active sites for heterogeneous catalysis by metal alloys based on molecular descriptors and electronic structure engineering" *Current Opinion in Chemical Engineering*, (2013). 2, 312-319. (IF=5.2) (P)
34. Holewinski, A., and Linic, S. "Elementary mechanisms in electrocatalysis: Revisiting the ORR Tafel slope." *Journal of the Electrochemical Society*, (2012). 159, H864-H870. (IF=4.3) (A)
35. Xin, H., Holewinski, A., and Linic, S. "Predictive structure-reactivity models for rapid screening of Pt-based multimetallic electrocatalysts for the oxygen reduction reaction" *ACS Catalysis*, (2012). 2, 12-16. (Cover Article) (IF=13.1) (A)
36. Xin, H., Holewinski, A., Schweitzer, N., Nikolla, E., and Linic, S. "Electronic structure engineering in heterogeneous catalysis: Identifying novel alloy catalysts based on rapid screening for materials with desired electronic properties" *Topics in Catalysis*, (2012). 55, 376. (IF=2.9) (P)
37. Nikolla, E., Holewinski, A., Schwank, J., and Linic, S. "Controlling carbon surface chemistry by alloying: carbon tolerant reforming catalyst." *Journal of The American Chemical Society*, (2006). 35, 11354-11355. (IF=16.4) (A)

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## Patents

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1. F. W. S. Lucas and A. Holewinski. *Electrochemical Synthesis of hydroxyvaleric acid from levulinic acid*. Provisional Patent Application No. 63/252,202 (Filed with US PTO October 5, 2021).
2. J. A. Roper, S. Balijepalli, P. Doll, A. S. C. W. Jones, C. R. Murdock, J. M. Robbins, A. Nomura, B. R. Bommarius, A. Holewinski, and G. Gadda. *Coating for aldehyde remediation and method of making*. Patent Application No. US16/625,881 (Filed with US PTO June 29, 2018; Publication date: May 28, 2020)

## Funding

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### *Current External*

(>\$5.4M raised as PI since Fall 2015)

NSF (CBET-2301381) Electrochemical Systems Program, \$599,434 ( PI: APH; co-PI C. Musgrave)  
*Understanding electrochemical hydrogenation reactions over post-transition metal electrodes: the role of incidental mediators and metastable phases*  
08/01/2023 - 07/31/2026

Research Corp. for Scientific Advancement Scialog Program (Award #29162), \$55,000 (PI: APH, co-PI A. Wuttig; \$55,000 per PI)  
*A radical approach to negative methane emissions*  
02/01/2023 - 01/31/2024

DOE BES Catalysis Science Program (DE-SC0023322), \$579,983 (PI: APH; co-I M. Janik)  
*Electro-oxidative valorization of biomass: design strategies for selective and stable catalysis*  
08/01/2022 - 07/31/2025

DOE BES Clean Energy Technology and Low-Carbon Manufacturing Program (DE-SC0023424), \$749,999 (PI: APH)  
*Electrochemically-Assisted Dehydrogenation Reactions for Dual-Electrode Hydrogen Evolution*  
01/01/2023 - 12/31/2025

ACS Petroleum Research Fund, \$110,000 (PI: APH)  
*Controlling hydrogenation selectivity for petrochemicals with well-defined active sites*  
07/01/2022 - 08/31/2024

Sloan Foundation / Research Corp. for Scientific Advancement Scialog Program (Award #28503), \$55,000 (PI: APH, co-PI's K. Hornbostel and Y. Liu; \$55,000 per PI)  
*Electric-swing solid state sorbents for direct air capture of CO<sub>2</sub>*  
02/01/2022 - 01/31/2024

NSF (CHE-2055689) Chemical Catalysis Program, \$448,169 + €168,334 ( PI: APH; co-PI's W. Zhang and R. Francke)  
*NSF-DFG Echem: Cooperativity Between Immobilized Redox Mediators for Selective Anodic Biomass Valorization*  
08/01/2021 - 07/31/2024

NSF (CBET-2004090) Catalysis Program, \$698,235 (PI: J. W. Medlin; co-PI's: APH and D. Schwartz)  
*Catalytic Selectivity Control in Electrochemical Systems using Self-Assembled Monolayers*  
08/15/2020 - 07/31/2023

NSF (CBET-1944834) Catalysis Program, \$650,714 (PI: APH)  
*CAREER: Understanding Bifunctionality in Organic Electro-oxidation Catalysis*  
01/01/2020 - 12/31/2024

### *Completed External*

NSF (MRI-1919845) Major Research Instrumentation Program, \$880,680 (PI: APH; co-PI's T. Cuk., S. George, J. W. Medlin, M. McGehee)

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*MRI: Acquisition of a High-Sensitivity Low-Energy Ion Scattering (HS-LEIS) Spectrometer with Multiple Reactive Environment Transfer for Interrogating Surfaces and Interfaces*  
08/01/2019 - 07/31/2022

NSF (CBET-1835967) Energy and Sustainability Program, \$342,695 (PI: APH)  
*MIEC Cascade Electrodes for High Density Energy Storage in Li<sub>2</sub>O<sub>2</sub>*  
08/01/2018 - 1/31/2022

NSF (CHE-1665176) Chemical Catalysis Program, \$649,998 (PI: APH; co-PI's J. W. Medlin and M. Janik; CU share: \$429,998 )  
*Manipulation of reaction selectivity in the electrochemical environment for biomass-to-chemicals conversions*  
09/01/2017 - 08/31/2020

NREL LDRD (UGA-0-41026-103), (PI: J. Schaidle; APH share: \$198,904)  
*Electrochemical Transformations to Enable Fuel and Chemical Production from the Carboxylate Platform*  
10/01/2017 - 09/31/2020

NSF (CBET-1806059) Catalysis Program, \$104,929 (PI: APH)  
*EAGER: Identifying Active Sites in Electrocatalysis by a Steady-State Isotope-Transient Technique*  
07/01/2018 - 06/30/2019

## *Internal*

CU Boulder Research & Innovation Seed Grant Program (\$50,000) 2022, (APH – PI, co-PI Oana Luca).  
*Revising Electrolysis for Sustainable Plastics*

Water-Energy Nexus IRT Seed Grant (\$16,000) 2018, (APH - PI, co-PI Se-Hee Lee),  
*Mixed-Conductor Cascade Electrodes for High Density Energy Storage in Li<sub>2</sub>O<sub>2</sub>*

RASEI Seed Grant (\$15,000) 2016, (APH - PI, co-PI Joshua Schaidle),  
*Electrochemical upgrading of biomass-derived carboxylic acids*

## Invited presentations

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### *Departmental, Industrial, or Organizational Seminars*

1. Leibniz Institute for Catalysis Rostock – Dec. 11, 2023
2. University of Copenhagen – Chemistry Department, Nov. 21, 2023
3. Technical University of Denmark – Physics Department, Nov. 14, 2023
4. University of Wisconsin Madison – Chemistry Dept., Seminar, Sept. 22, 2022.
5. University of Delaware – Catalysis Center for Energy Innovation, Seminar, Sept 14, 2022
6. University of New Mexico – Chemical and Biological Engineering. Dept. Seminar, April 20, 2022.
7. Virginia Tech – Dept. of Chemical Engineering Dept. Seminar, March 14, 2022.
8. Oregon State University – Chemical Biological and Environmental Eng. Dept. Seminar, Feb. 7, 2022.
9. University of Oregon – Chemistry Dept. Seminar, Feb. 4, 2022.
10. Catalysis Club of Chicago – Annual Symposium Keynote Speaker. May 13, 2021
11. Technical University of Denmark – “CatTheory” Webinar Series, Feb. 18, 2021
12. University of Houston – Chemical and Biomolecular Engineering Dept., Seminar, Dec. 4, 2020
13. University of Michigan – Chemical Engineering Dept., Seminar, Nov. 12, 2020
14. Electrochemical Society Detroit Chapter – “Trailblazers in Electrochemistry Seminar Series” Oct. 29, 2020
15. UC Santa Barbara – Catalysis Seminar Series. Sept. 10, 2020
16. Colorado State University – Chemical and Biological Engineering Dept., Seminar, Feb. 27, 2020.
17. Lehigh University – Materials Science and Engineering Dept., Seminar, Dec. 18, 2019.
18. UC Riverside – Materials Science and Engineering Program, Seminar, Jan 27, 2016.

### *Pre-2015*

19. University of Illinois Urbana-Champaign – Dept. of Chemical and Biomolecular Engineering,

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Seminar, Feb. 2014

20. University of Colorado Boulder – Dept. of Chemical and Biological Engineering, Seminar, Feb. 2014
21. University of Virginia, Dept. of Chemical Engineering, Seminar, Jan. 2014

## *Invited Conference Talks*

1. Annual Meeting of the American Chemical Society. “Electrochemically-assisted dehydrogenation and prospects for anodic hydrogen” Indianapolis, March 27, 2023
2. Annual Meeting of the American Chemical Society. “A Kinetic Analysis of the CO Electro-Oxidation Reaction on Bimetallics: Understanding the Interplay of Bifunctional and Electronic Effects” Indianapolis, March 27, 2023
3. Annual Meeting of the American Chemical Society. “Electro-oxidation pathways for biomass derived furans.” Chicago, August 24, 2022.
4. Annual Meeting of the American Chemical Society. “Steering selectivity with free-atom-like d-states in single-atom-alloy catalysts.” Chicago, August 22, 2022.
5. ACS Colloid and Surface Science Symposium. “A Kinetic Analysis of the CO Electro-Oxidation Reaction on Bimetallics: Understanding the Interplay of Bifunctional and Electronic Effects” Golden, Colorado, July 13, 2022.
6. Rocky Mountain Catalysis Society Annual Symposium. “Steering selectivity with free-atom-like d-states in single-atom-alloy catalysts.” Golden, Colorado, April 22, 2022.
7. Annual Meeting of the American Chemical Society. “Electro-oxidation pathways for biomass derived furans.” San Diego, March 24, 2022
8. Annual Meeting of the American Chemical Society. “A Kinetic Analysis of the CO Electro-Oxidation Reaction on Bimetallics: Understanding the Interplay of Bifunctional and Electronic Effects” San Diego, March 22, 2022
9. American Institute of Chemical Engineers National Meeting. “Electro-oxidation pathways for biomass derived furans.” Boston, November 8, 2021
10. Annual Meeting of the American Chemical Society. “Steering selectivity with free-atom-like d-states in single-atom-alloy catalysts.” Atlanta, August 23, 2021.
11. Annual Meeting of the American Chemical Society. “Electro-oxidation pathways for biomass derived furans.” Atlanta, August 23, 2021.
12. ChemistsLive Conference (ACS Cross-Division Event). “Electrochemical Oxidation Pathways of Biomass-Derived Furanics” September 25, 2020
13. ‡ Annual Meeting of the American Chemical Society. “Impact of Charge Transfer Model on the Identification of “Optimal” Electrocatalysts” San Francisco, August 2020.
14. ‡ Annual Meeting of the American Chemical Society. “A Kinetic Analysis of the CO Electro-Oxidation Reaction on Bimetallics: Understanding the interplay of Bifunctional and Electronic Effects.” San Francisco, August 2020.
15. ‡ Annual Meeting of the American Chemical Society. “Electro-Oxidation Pathways for Biomass-Derived Furanics” Philadelphia, March 2020.
16. ‡ Annual Meeting of the American Chemical Society. “A Kinetic Analysis of the CO Electro-Oxidation Reaction on Bimetallics: Understanding the Interplay of Bifunctional and Electronic Effects” Philadelphia, March 2020.
17. American Institute of Chemical Engineers Annual Meeting. “Insights on the Electrochemical Conversion of Biomass Derivatives” Orlando, Florida. November 11, 2019.
18. Annual Meeting of the American Chemical Society. “Insights on the Electrochemical Conversion of Biomass Derivatives” Orlando, Florida. April 3, 2019.
19. Annual Meeting of the American Chemical Society. “Insights on the Electrochemical Conversion of Biomass Derivatives” Boston, Massachusetts. August 21, 2018.
20. American Institute of Chemical Engineers Annual Meeting. “Impacts of Aminopolymer-Support Interaction on CO<sub>2</sub> Sorption Performance Probed by Neutron Scattering Techniques”

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Minneapolis, Minnesota. October 30, 2017.

21. Annual Meeting of the American Chemical Society. “Mechanistic Analysis of Electrochemical Oxygen Reduction and Development of Economical Silver-alloy Catalysts for Low Temperature Fuel Cells.” San Francisco, California. August 11, 2014.

*‡ denotes cancellation due to COVID-19*

## *Invited Workshop Talks*

1. ACS Catalysis Division Summer School Series: “The Confluence of Kinetics and Thermodynamics in Electrocatalysis: Kinetic Fingerprints and Catalyst Design” Webinar, 2023

## Contributed presentations

*(Oral presentations unless poster noted)*

1. Joseph Hasse, Marc Manyé Ibáñez, Alex Román, and Adam Holewinski. “Electro-oxidation pathways for biomass-derived furans” Annual Meeting of the Electrochemical Society. Gothenburg, Sweden. October 10, 2023.
2. Todd Whittaker, Adam Baz, Taylor Spivey, Lindsey Hamblin, and Adam Holewinski. “A Kinetic Analysis of CO Electro-Oxidation on Bimetallics: Understanding the Interplay of Bifunctional and Electronic Effects” North American Catalysis Society National Meeting. Providence, Rhode Island. June 22, 2023.
3. Yuval Fishler, Adam Holewinski, Wilson A. Smith. “Comparison of Sn electrocatalyst thin films for ATR-FTIR applications in CO<sub>2</sub> reduction” North American Catalysis Society National Meeting. Providence, Rhode Island. June 20, 2023.
4. Nathanael C. Ramos, J. Will Medlin, and Adam Holewinski. “Comparison of Sn electrocatalyst thin films for ATR-FTIR applications in CO<sub>2</sub> reduction” North American Catalysis Society National Meeting. Providence, Rhode Island. June 19, 2023.
5. Adam Baz, Taylor Spivey, Todd Whittaker, and Adam Holewinski. “A Kinetic Analysis of the CO Electro-Oxidation Reaction on Bimetallics: Understanding the Interplay of Bifunctional and Electronic Effects” American Institute of Chemical Engineers National Meeting. Phoenix, Arizona. November 15, 2022
6. Taylor Spivey and Adam Holewinski. “Steering selectivity with free-atom-like d-states in single-atom-alloy catalysts.” American Institute of Chemical Engineers National Meeting. Phoenix, Arizona. November 15, 2022
7. Adam Holewinski (*Poster*): “Electrocatalytic Conversion Mechanisms for Renewable Fuels and Chemicals.” Gordon Research Conference on Catalysis. New London NH, June 2022.
8. Adam Baz and Adam Holewinski. “A Microkinetic Understanding of CO and Methanol Electro-Oxidation on Bimetallic Catalysts” North American Catalysis Society National Meeting. New York, New York. May 26, 2022.
9. Taylor Spivey and Adam Holewinski. “Interactions Between Free Atom Like States of Single Atom Alloys and Frontier Molecular Orbitals of Unsaturated Aldehydes” North American Catalysis Society National Meeting. New York, New York. May 25, 2022.
10. Joseph Hasse and Adam Holewinski. “Surface mechanisms for furfural electrooxidation to value-added chemicals probed by ATR-SEIRAS” North American Catalysis Society National Meeting. New York, New York. May 23, 2022.
11. Taylor Spivey and Adam Holewinski. “Driving Selectivity with Free-Atom-Like States on Single Atom Alloy Catalysts” Annual Meeting of the American Chemical Society. San Diego, California. March 20, 2022
12. Taylor Spivey and Adam Holewinski. “Driving Selectivity with Free-Atom-Like States on Single Atom Alloy Catalysts” American Institute of Chemical Engineers National Meeting. Boston, Massachusetts. November 16, 2021
13. Joseph Hasse and Adam Holewinski. (*Poster*) “Elucidation of Surface Moieties during Furfural Oxidation on Platinum Catalysts Using in-Situ Spectroscopy” American Institute of Chemical

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- Engineers National Meeting. Boston, Massachusetts. November 16, 2021
14. Adam Baz and Adam Holewinski. "Understanding CO and Methanol Electro-Oxidation Activity on  $\text{Ag}_x\text{Pd}_{1-x}/\text{C}$  Alloys Under Alkaline Conditions" American Institute of Chemical Engineers National Meeting. Boston, Massachusetts. November 8, 2021
  15. Alex Roman, Joe Hasse, Naveen Agrawal, Mike Janik, and Adam Holewinski. "Electro-oxidation pathways for biomass-derived furans." Annual Meeting of the Electrochemical Society. Orlando, Florida. October 12, 2021.
  16. Francisco W.S. Lucas and Adam Holewinski. "Electrochemical Valorization of Biomass-Derived Feedstocks: Levulinic Acid to 4-Hydroxyvaleric Acid" Annual Meeting of the Electrochemical Society. Orlando, Florida. October 11, 2021.
  17. Alexander Delluva and Adam Holewinski. "Evolution of cathodic interfaces with the solid state electrolyte  $\text{Li}_7\text{La}_3\text{Zr}_2\text{O}_{12}$ ." American Institute of Chemical Engineers National Meeting. Orlando, Florida. November 2019
  18. Adam Baz and Adam Holewinski. "A kinetic analysis of the CO electro-oxidation reaction on Pt bimetallics: Understanding the interplay of bifunctional and electronic effects." American Institute of Chemical Engineers National Meeting. Orlando, Florida. November 2019
  19. Alex Roman, Joe Hasse, J.W. Medlin and Adam Holewinski. "Electro-oxidation of furans to value-added chemicals." Annual Meeting of the Electrochemical Society. Atlanta, Georgia. October 16, 2019.
  20. Adam Baz and Adam Holewinski. "A kinetic analysis of the CO electro-oxidation reaction on Pt bimetallics: Understanding the interplay of bifunctional and electronic effects." Annual Meeting of the Electrochemical Society. Atlanta, Georgia. October 15, 2019.
  21. Alex Roman, Joe Hasse, J.W. Medlin and Adam Holewinski. "Insights on the Electrochemical Conversion of Biomass Derivatives." Annual Meeting of the American Chemical Society. San Diego, California. August 28, 2019.
  22. Alex Roman, J.W Medlin, and Adam Holewinski. "Insights on the Electrochemical Conversion of Biomass Derivatives." North American Catalysis Society National Meeting. Chicago, Illinois. June 26, 2019.
  23. Adam Baz and Adam Holewinski. "Independent tuning of active sites in bifunctional methanol electro-oxidation catalysis." North American Catalysis Society National Meeting. Chicago, Illinois. June 26, 2019.
  24. Alex Roman, J.W Medlin, and Adam Holewinski. (*Poster*) "Electro-oxidation of furans to value-added chemicals." North American Catalysis Society National Meeting. Chicago, Illinois. June 25, 2019.
  25. Alex Roman, J.W Medlin and Adam Holewinski. "Electro-oxidation of furans to value-added chemicals." Society of Hispanic Professional Engineers National Convention. Pasadena, California. October 18, 2018.
  26. Alex Roman, J.W Medlin and Adam Holewinski. "Electro-oxidation of furans to value-added chemicals." American Institute of Chemical Engineers National Meeting. Pittsburgh, Pennsylvania. October 30, 2018.
  27. Adam Holewinski (*Poster*): "Electrocatalytic Conversion Mechanisms for Renewable Fuels and Chemicals." Gordon Research Conference on Catalysis. New London NH, June 2018.
  28. Alex Roman, J.W Medlin, and Adam Holewinski. (*Poster*) "Electrocatalytic Upgrading of Biomass-Derived Oxygenates" North American Catalysis Society National Meeting. Denver, Colorado. June 7, 2017.
  29. Adam Holewinski, Alex Roman, and Cody Barnhill. "Probing the nature of active sites for methanol oxidation with transient isotope kinetics." Annual Meeting of the American Chemical Society. San Francisco, California. April 3, 2017.
  30. Adam Holewinski (*Poster*): "Electrocatalytic Conversion Mechanisms for Renewable Fuels and Chemicals." Gordon Research Conference on Catalysis. New London NH, June 2016.
  31. Adam Holewinski, Miles Sakwa-Novak, and Christopher W. Jones, "Neutron Scattering Characterization of  $\text{CO}_2$  Sorbent Materials: The Morphology of Polyethyleneimine in



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- Mesoporous Silica and Its Performance Impacts.”, American Institute of Chemical Engineers National Meeting, Salt Lake City Utah, November 2015
32. Adam Holewinski and Suljo Linic, “Pt-Free Electrocatalysts for Efficient Oxygen Reduction In Alkaline Fuel Cells: Experimental and Computational Insights.”, American Institute of Chemical Engineers National Meeting, Salt Lake City Utah, November 2015
  33. Adam Holewinski, Miles Sakwa-Novak, and Christopher W. Jones, "Neutron scattering characterization of amino-polymer/silica composite CO<sub>2</sub> adsorbents: Morphology, mobility, and consequences for performance.”, North American Catalysis Society National Meeting. Pittsburgh, Pennsylvania. June 15, 2015.
  34. Adam Holewinski, Miles Sakwa-Novak, and Christopher W. Jones, "Neutron scattering characterization of amino-polymer/silica composite CO<sub>2</sub> adsorbents: Morphology, mobility, and consequences for performance.”, Annual Meeting of the American Chemical Society. Denver, Colorado. March 24, 2015.
  35. Adam Holewinski and Suljo Linic, “Mechanistic analysis of electrochemical oxygen reduction and development of economical silver alloy catalysts for low temperature fuel cells.”, Annual Meeting of the American Chemical Society. Denver, Colorado. March 22, 2015.
  36. Adam Holewinski and Suljo Linic, “ Development of Ag-alloy Oxygen Reduction Electrocatalysts for Low Temperature Fuel Cells.”, American Institute of Chemical Engineers National Meeting. San Francisco, California. November 7, 2013.
  37. Adam Holewinski and Suljo Linic, “ Understanding ORR Kinetics Through Microkinetic Modeling: Revisiting the Tafel Slope.”, American Institute of Chemical Engineers National Meeting. San Francisco, California. November 7, 2013.
  38. Adam Holewinski and Suljo Linic, “ Kinetic analysis of electrochemical oxygen reduction and development of Ag-alloy catalysts for low temperature fuel cells.”, North American Catalysis Society National Meeting. Louisville, Kentucky. June 4, 2013.
  39. Adam Holewinski, and Suljo Linic, “ Development of Low-cost Ag-alloy Oxygen Reduction Electrocatalysts for Low Temperature Fuel Cells”, Michigan Catalysis Society Spring Symposium. Dearborn, Michigan. May 7, 2013.
  40. Adam Holewinski and Suljo Linic, “ Pt-free electrocatalysts for efficient oxygen reduction in alkaline fuel cells:Experimental and computational insights.”, American Institute of Chemical Engineers National Meeting. Pittsburgh, Pennsylvania. October 31, 2012.
  41. Adam Holewinski and Suljo Linic, “ Revisiting the Tafel Slope: Understanding ORR Kinetics Through Microkinetic Modeling.”, American Institute of Chemical Engineers National Meeting. Pittsburgh, Pennsylvania. October 31, 2012.
  42. Adam Holewinski and Suljo Linic, “ Understanding and optimizing the kinetic behavior of the oxygen reduction reaction”, Annual Meeting of the American Chemical Society. Philadelphia, Pennsylvania. August 19, 2012.
  43. Adam Holewinski, Hongliang Xin, and Suljo Linic, “ Understanding the kinetic behavior of the oxygen reduction reaction for rapid catalyst screening”, Michigan Catalysis Society Spring Symposium. Midland, Michigan. May 14, 2012.
  44. Adam Holewinski and Suljo Linic, “ Pt-free electrocatalysts for efficient oxygen reduction in alkaline fuel cells: Experimental and computational insights.”, American Institute of Chemical Engineers National Meeting. Minneapolis, Minnesota. October 19, 2011.
  45. Adam Holewinski and Suljo Linic. “Oxygen reduction on metals in acidic and basic media: Insights toward design of Pt-free electrocatalysts.” North American Catalysis Society National Meeting. Detroit, Michigan. June 6, 2011.
  46. Adam Holewinski and Suljo Linic, (Poster) “Experimental and Computational Studies of Oxygen Reduction on Platinum and Silver Catalysts in Acidic and Basic Media”, American Institute of Chemical Engineers National Meeting. Salt Lake City, Utah. November 10, 2010.
  47. Adam Holewinski and Suljo Linic, “ Design of novel platinum-free electrocatalysts for oxygen reduction in alkaline fuel cells”, American Institute of Chemical Engineers National Meeting. Salt Lake City, Utah. November 8, 2010.

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48. Adam Holewinski, Eranda Nikolla, and Suljo Linic, "Degradation of the performance of solid oxide fuel cell (SOFC) electrodes in extreme environments", Annual Meeting of the American Chemical Society. Washington, DC. August 18, 2009.

## Teaching

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### *Courses Taught*

- CHEN 4838/5838: Electrochemical Engineering, (U. Colorado)  
· Fall 2018, Spring 2022 (full course), Summer 2020 (1 cr. 'Module')
- CHEN 4521: Physical Chemistry for Engineers, (U. Colorado)  
· Spring 2023, Spring 2019, Spring 2018, Spring 2017
- CHEN 5390: Chemical Reaction Engineering, (U. Colorado)  
· Fall 2022, Fall 2021, Fall 2020, Fall 2019, Fall 2017, Fall 2016, Fall 2015
- CHEN 3660: Energy Fundamentals, (U. Colorado)  
· Spring 2021

### *Workshops Attended*

- 2015 FTEP: *Teaching in a nutshell* (U. Colorado)  
2017 FTEP: *Flipping the Class for the Skeptic* (U. Colorado)  
2017 FTEP: *Effective Facilitation of Clickers and Peer Instruction* (U. Colorado)

### *Curriculum and Educational Materials Development*

- Wrote interactive modules illustrating quantum chemical principles (posted to learncheme.com)
- Developed new course CHEN 4838/5838: Electrochemical Engineering
- Wrote course pack for CHEN 5390 (full content of course)

## Mentoring

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### *PhD Students* (\* designates graduated; ‡ designates co-advised student)

1. Alex M. Roman, 2020\*‡ PhD (co-advised by J.W.M.); NSF GRFP Fellow, 2015-18 (Current position: Blue Origin, Seattle)
2. Alexander Delluva, 2021\*, PhD; (Current position: Solid Power, Denver)
3. Adam Baz, 2022\*, PhD; DoEd GAANN Fellowship 2018; (Current position: Boston Metal)
4. Joseph Hasse 2022\*, PhD Candidate
5. Taylor Spivey, PhD Candidate; DoEd GAANN Fellowship 2019, DOE SCGSR Fellow 2020
6. Faysal Al Khulaifi‡, PhD Candidate (co-advised by J.W.M.)
7. Yuval Fishler‡, PhD Pre-Candidate (co-advised by W.A.S.)
8. Todd Whittaker‡, PhD Pre-Candidate (co-advised by C.B.M.)
9. Nathanael Ramos‡, PhD Pre-Candidate (co-advised by J.W.M.)
10. Yiqi Xu‡, PhD Pre-Candidate (co-advised by J.W.M.)
11. Marc Manyé Ibáñez, PhD Pre-Candidate
12. Emma Hollis, PhD Pre-Candidate

### *MS Students*

1. Jessica Dudoff, 2017-20
2. Cody Barnhill, 2015-16
3. Grey Garrett, 2018-19

### *Postdoc*

1. Dr. Zachary Barton (PhD Chemistry U. Illinois Urbana-Champaign), 2017-19 (Current position: Lockheed Martin, Denver)
2. Dr. Francisco Willian de Souza Lucas, (PhD Chemistry Federal U. São Carlos), 2020-22 (Current position: Nuclera Nucleics, Boston)

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3. Dr. Yaran Zhao (PhD Nankai University), 2021-22 (Current position: Assistant Professor, Beijing Normal University at Zhuhai)
4. Dr. Rupali Mittal (PhD University of Delhi), 2023-present

## *Undergraduate Researchers (visiting students noted, others CU-Boulder, \* = Senior Thesis, ‡ = paper author) (17)*

Hudson Neyer (Arapahoe CC) Samuel Burke-Bevis, Robert Benke, Jonas Kulberg-Savercool\*, Lindsey Hamblin\*, Mason Lyons (U. Iowa, YSSRP Program), Nina Hooper\*, Kasie Coogan (U. Alabama, YSSRP Program); Matthew Zhang; Hussain Almajed; Samantha Kaczaral (Vanderbilt, YSSRP program); Griffin Drake (Oregon State, YSSRP program); Nicholas Kurtyka‡; George Curtis; Jordan Finzel (WPI, C2B2 REU program); Roy Madrid; Sarah Burns (DLA program)

## *PhD Committee Member (29)*

Rishabh Tennankore (CHBE); Brian Radka (CHBE); Ezra Baghdaddy (CHBE); Filipe de Sousa Evangelista (CHBE); Nathan Jarvey (CHBE); Lacey Roberts (CHBE); Elizabeth Allan-Cole (CHBE); Hanna Lyle (MSE); Xinpei Zhou (CHBE); Zack Blanchette (CHBE); Ben Greydanus (CHBE); Andrew Yeang (CHBE); Nicholas Singstock (CHBE); Mat Rasmussen (CHBE); Alex Jenkins (CHBE); Glenn Hafenstine (CHBE); William McNeary (CHBE); Lesli Mark (CHBE); Natalie Schieber (CHBE); Shiyi Wang (CHBE); Christopher Bartel (CHBE); Ryan Trotter (CHBE); Ashutosh Mishra (CHBE); Mike Lotto (AES); Franklin Maharaj (Chemistry); Mohammed Alkhatir (CHBE); Brian Robb (Chemistry); Scott Waters (Chemistry)

*External:* PhD Opponent, Sihang Liu, Technical University of Denmark

## Service

### *Professional Organization Leadership Roles*

- North American Catalysis Society Board of Directors – *Rocky Mountain Catalysis Society Representative*, 2022-

### *Journal Collection Guest Editorship*

- “Advanced in Electrochemical Conversions for a Greener Chemical Industry”. *Green Chemistry*. Co-Editors: J.P. Tessonier, V. Glezakou, A. Holewinski, and J. Lopez-Ruiz. (*Submission handling in progress*)

### *Conference organization*

1. Co-Chair, “Electrocatalysis and Photoelectrocatalysis: Fuel Cells” AIChE National Meeting, Salt Lake City Utah, November 2015
2. Organizer/Chair, in “Electrocatalysis and Photoelectrocatalysis” and “Fuels from Sun” (2 sessions each). AIChE National Meeting, San Francisco CA, November 2016
3. Organizer/Chair for “Electrocatalysis for Energy Conversion” (4 sessions). American Chemical Society, Spring National Meeting, San Francisco CA, April 2017
4. Program Committee and Session Chair (“Catalytic Nanoparticles”). North American Catalysis Society National Meeting, Denver, Colorado, June 2017
5. Organizer/Chair for “Electrocatalysis for Energy Conversion and Storage” (4 sessions). American Chemical Society, Fall National Meeting, Washington DC, August 2017
6. Organizer/Chair, in “Electrocatalysis and Photoelectrocatalysis” and “Fuels from Sun” (3 sessions). AIChE National Meeting, Minneapolis MN, November 2017
7. Organizer/Chair, in “Rational Catalyst Design” (1 session). AIChE National Meeting, Pittsburgh PA, October 2018
8. Session Chair (2 Sessions: “Catalysis with Ligand Effects”, “Photoelectrochemistry and Plasmonics”). North American Catalysis Society National Meeting, Chicago IL, June 2019.
9. Organizer/Chair for “Electrocatalysis for Energy Conversion and Storage” (4 sessions). American Chemical Society, Fall National Meeting, San Diego CA, August 2019.
10. ‡Organizer for “ACS Divisional Awards Symposium” American Chemical Society, Fall National Meeting, San Francisco CA, August 2020.

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11. Organizer for “ACS Divisional Awards Symposium” American Chemical Society, Fall National Meeting, Atlanta GA, August 2021.
12. Session Chair (“Fuel Cell Catalysts”). North American Catalysis Society National Meeting, New York NY, May 2022
13. Organizer for “ACS Divisional Awards Symposium” American Chemical Society, Spring National Meeting, Indianapolis, March 2023.

## *Journal peer-review service*

- Referee for ~40 manuscripts per year. Journals include Nature, Nature Catalysis, Nature Chemistry, Journal of the American Chemical Society, Angewandte Chemie, Science Advances, Journal of Catalysis, ACS Catalysis, ACS Energy Letters, Joule, ACS Applied Materials & Interfaces, Journal of Physical Chemistry C, Applied Catalysis A: General, Applied Catalysis B: Environmental, Industrial & Engineering Chemistry Research, Chemical Communications, Catalysis Science & Technology, Catalysis Today.

## *Funding agency peer review*

- Panel Reviewer: NSF CBET Catalysis Program; NSF CBET Process Systems, Reaction Engineering and Molecular Thermodynamics Program;
- DOE Basic Energy Sciences – Catalysis Science Program and CPIMS Program, ad-hoc reviews
- ACS Petroleum Research Fund – ad-hoc reviews
- Stanford Synchrotron Radiation Lightsource – ad-hoc reviews
- Beckman Foundation – Postdoc Fellowship in Chemical Sciences

## *Departmental and University service*

- CEAS: Surface Science Characterization User Facility: Creation, planning, installation, and user liaison, 2020-
- CHBE Seminar Series Organizer, 2021-22
- CHBE Leadership Team, 2020-21
- RASEI Director Search Committee, 2020
- CHBE Undergraduate Committee, 2019-
- CHBE Faculty Committee, 2018
- RASEI Space Allocation Committee, 2018-
- CHBE Graduate Committee, 2016 – 2018 (Admissions, Curriculum, Recruiting)
- Ad-hoc faculty search reviews in CHBE and RASEI annually
- CU Youth Scholars Summer Research Program – Career Development Workshop speaker, 2018-
- Student researcher group ‘Catalysis Supergroup’ faculty advisor 2015-2018

## *Other*

- Colorado Center for Biofuels and Biorefining REU guest speaker, 2017
- EFRC Early Career Network ‘Academic Interview’ workshop guest speaker, 2016

## *Society memberships*

American Institute of Chemical Engineering; American Chemical Society; North American Catalysis Society; Electrochemical Society