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Research Interests

Energy, sustainability, and catalysis. Catalyst engineering and reactor engineering in relation to energy conversion reactions for production, utilization, and storage. Topics include water electrolysis for green H_2 production, CO_2 capture, fuel cells, CO_2 electrocatalysis, NH_3 production, energy storage, solar fuels, and thermochemical processes including CO_2/CO hydrogenation and alkane dehydrogenation, among others.

Academic Appointments

May 2023 – present	Professor of Chemical Engineering, Stanford University, CA Professor of Energy Sciences Engineering, Stanford Doerr School of Sustainability, Stanford University, CA Professor of Photon Science, SLAC National Accelerator Laboratory
March 2018 – present	Director, SUNCAT Center for Interface Science and Catalysis
2018 – present	Senior Fellow, Precourt Institute for Energy, Stanford University
September 2022 – April 2023	Associate Professor, Energy Sciences Engineering, Stanford Doerr School of Sustainability, Stanford University, CA
April 2015 – April 2023	Associate Professor, Photon Science, SLAC National Accelerator Laboratory
August 2014 – April 2023	Associate Professor, Chemical Engineering, Stanford University, CA
July 2014 – March 2018	Deputy Director, SUNCAT Center for Interface Science and Catalysis
September 2007 – August 2014	Assistant Professor, Chemical Engineering, Stanford University, CA

Education

Denmark Technical University	Physics	post-doc	2005-2007
University of California, Santa Barbara	Chemical Engineering	post-doc	2004-2005
University of California, Santa Barbara	Chemical Engineering	M.S./Ph.D.	2000/2004
Stanford University	Chemical Engineering	B.S.	1998

Awards and Honors

- Paul H. Emmett Award in Fundamental Catalysis, North American Catalysis Society, 2021.
- Clarivate Analytics Highly Citied Researcher, Top 1% by Citations, 2018-present.
- Volkswagen/BASF Science Award Electrochemistry, 2014.
- Resonate Award, Resnick Sustainability Institute at the California Institute of Technology, 2014.
- 2014 *Energy & Environmental Science* Readers' Choice Award and Lectureship
- Presidential Early Career Award for Scientists and Engineers (PECASE), 2011.
- U.S. Dept. of Energy Hydrogen and Fuel Cell Program Research & Development Award, 2011.
- National Science Foundation (NSF) CAREER Award, 2011.
- Global Climate Energy Project (GCEP) Distinguished Lecturer, 2011.
- Keynote address at the 5th International Symposium of Molecular Aspects of Catalysis by Sulphides, Copenhagen, Denmark, June 2010.

- Outstanding Faculty Mentor Award by the Stanford Society of Chicano/Latino Engineers and Scientists (SSCLES) on behalf of the Dean of the School of Engineering and Engineering Diversity Programs, 2009-2010.
- Mohr-Davidow Ventures (MDV) Innovator Award, 2009.
- Hellman Faculty Scholar Award, 2009.
- National Science Foundation, BRIGE Award, 2008.
- Terman Fellowship, Stanford University, 2007.
- Reid and Polly Anderson Faculty Scholar Award, Stanford University, 2007.
- H.C. Ørsted Post-doctoral Fellowship, Denmark Technical University, 2005.
- Best Presentation, KAIST-UCSB "Partners Across the Globe" Symposium, UCSB, California 2005.
- Fiona Goodchild Award for Excellence as a Graduate Student Mentor of Undergraduate Research, University of California, Santa Barbara, 2004.
- Rockwell Fellowship in Inorganic Materials, 2001-2002.
- Outstanding Teaching Assistant, University of California, Santa Barbara, 2001-2002.
- GEM Ph.D. Engineering Fellowship, Rohm & Haas Company, 2000-2001.
- GEM M.S. Engineering Fellowship, Rohm & Haas Company, 1998-1999.
- Graduate Division Fellowship, University of California, Santa Barbara, 1998-1999.
- James W. Lyons Award for Service, Stanford University, Stanford, CA, 1998.
- American Institute of Chemical Engineers (AIChE) Minority Affairs Committee Scholarship for College Students, 1998.
- National Merit Scholar, 1994.
- National Hispanic Scholar, 1994.
- Top Score in Puerto Rico, ACS National High School Chemistry Exam, 1994.
- High School Valedictorian, Saint John's School, Santurce, Puerto Rico, 1994.

Professional Societies

American Institute of Chemical Engineers (AIChE), American Chemical Society (ACS)
The Electrochemical Society (ECS), North American Catalysis Society, (NACS), Materials Research Society (MRS), International Society of Electrochemistry (ISE)

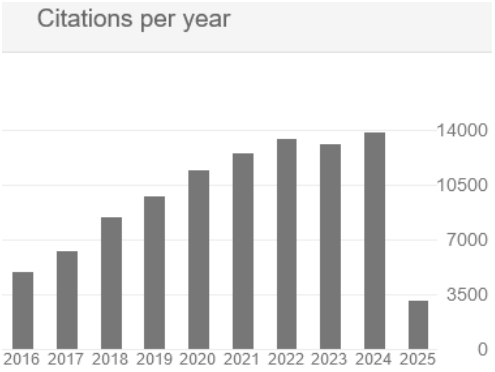
Relevant Industrial Experience

Rohm & Haas Company, Spring House, PA Monomers Research & Development	June 2000 – August 2000
Rohm & Haas Company, Houston, TX Materials Inspection Group`	June 1998 – August 1998
The Boeing Company, Seattle, WA Manufacturing Research & Development	June 1997 – August 1997

Publication Citation Information

Per Google Scholar (March 6, 2025):

	Total	**Since 2018**
Citations	107,549	67,384
H-Index	109	88
i10-Index	258	234



List of Publications

2025

(285) Katherine Yan, Sang-Won Lee, Kyra MK Yap, Aniket S Mule, Ryan T Hannagan, Jesse E Matthews, Gaurav A Kamat, Dong Un Lee, Michaela Burke Stevens, Adam C Nielander, Thomas F Jaramillo, On-line Inductively Coupled Plasma Mass Spectrometry Reveals Material Degradation Dynamics of Au and Cu Catalysts during Electrochemical CO_2 Reduction, *Journal of the American Chemical Society* (2025) 147, 5, 4079-4088 10.1021/jacs.4c13233.

(284) Colin F Crago, Simon Li, Ashton M Aleman, Tana Siboonruang, Milenia Rojas Mendoza, Thomas F Jaramillo, Michaela Burke Stevens, Effects of Iron Impurities and Content on Electrochemical Performance and Oxygen Evolution Selectivity of Nickel Catalysts for Ethanol Oxidation, *Journal of the American Chemical Society* (2025) 147, 5, 3925-3930 10.1021/jacs.4c15365.

(283) Peter Benedek, Yamile E Cornejo-Carrillo, Alden H O'Rafferty, Valerie A Niemann, Sang-Won Lee, Eric J McShane, Matteo Cargnello, Adam C Nielander, Thomas F Jaramillo, Temperature-dependent solid electrolyte interphase reactions drive performance in lithium-mediated nitrogen reduction to ammonia, *Joule* (2025) 10.1016/j.joule.2024.101810.

(282) Thomas JP Hersbach, Angel T Garcia-Esparza, Selwyn Hanselman, Oscar A Paredes Mellone, Thijs Hoogenboom, Ian T McCrum, Dimitra Anastasiadou, Jeremy T Feaster, Thomas F Jaramillo, John Vinson, Thomas Kroll, Amanda C Garcia, Petr Krtil, Dimosthenis Sokaras, Marc TM Koper, Platinum hydride formation during cathodic corrosion in aqueous solutions, *Nature Materials* (2025) 10.1038/s41563-024-02080-y.

(281) Soo Hong Lee, Jaime E Avilés Acosta, Daewon Lee, David M Larson, Hui Li, Junjie Chen, Jinyoung Lee, Ezgi Erdem, Dong Un Lee, Sarah J Blair, Alessandro Gallo, Haimei Zheng, Adam C Nielander, Christopher J Tassone, Thomas F Jaramillo, Walter S Drisdell, Structural Transformation and Degradation of Cu Oxide Nanocatalysts during Electrochemical CO_2 Reduction, *Journal of the American Chemical Society*, (2025). 10.1021/jacs.4c14720

2024

(280) Jesse E Matthews, Jaime E Avilés Acosta, Sang-Won Lee, Dongrak Oh, Tiras Y Lin, Kyra MK Yap, Junjie Chen, Ji-Wook Jang, Dong Un Lee, Adam C Nielander, Thomas F Jaramillo, Operando Surface-Enhanced Infrared Spectroscopy Connects Interfacial Dynamics with Reaction Kinetics During Electrochemical CO_2 Reduction on Copper, *ACS Catalysis*, (2024).
DOI: 10.1021/acscatal.4c05532

(279) Miika Mattinen, Johanna Schröder, Giulio D'Acunto, Mikko Ritala, Thomas F Jaramillo, Michaela Burke Stevens, Stacey F Bent, Dynamics of precatalyst conversion and iron incorporation in nickel-based alkaline oxygen evolution reaction catalysts, *Cell Reports Physical Science*, (2024).
DOI: 10.1016/j.xcrp.2024.102284

(278) Chen Zhang, Valerie A Niemann, Peter Benedek, Thomas F Jaramillo, Mathieu Doucet, Extracting Thin Film Structures of Energy Materials Using Transformers, *ACS Physical Chemistry Au*, (2024).
DOI: 10.1021/acsphyschemau.4c00054

(277) Aniket S Mule, Kevin Tran, Ashton M Aleman, Yamile E Cornejo-Carrillo, Gaurav A Kamat, Michaela Burke Stevens, Thomas F Jaramillo, Advancing Insights into Electrochemical Pre-Treatments of Supported Nanoparticle Electrocatalysts by Combining a Design of Experiments Strategy with In Situ Characterization, *Advanced Energy Materials*, (2024).
DOI: 10.1002/aenm.202401939

(276) Kyra MK Yap, Sol A Lee, Tobias A Kistler, Darci K Collins, Emily L Warren, Harry A Atwater, Thomas F Jaramillo, Chengxiang Xiang, Adam C Nielander, Addressing challenges for operating electrochemical solar fuels technologies under variable and diurnal conditions, *Frontiers in Energy Research*, (2024).
DOI: 10.3389/fenrg.2024.1483914

(275) Gaurav A Kamat, Melissa E Kreider, Johanna Schröder, Roulince B Dukuly Jr, Joseph T Perryman, Bjørt O Joensen, Jesse E Matthews, Ashton M Aleman, Michaela Burke Stevens, Thomas F Jaramillo, In Situ ORR Dynamics of Non-Precious Transition Metal Electrocatalysts: the Case of Manganese Antimony X-ides, *ACS Catalysis*, (2024).
DOI: 10.1021/acscatal.4c03260

(274) Wonsik Jang, Dongrak Oh, Jinyoung Lee, Jongkyoung Kim, Jesse E Matthews, Hyoseok Kim, Sang-Won Lee, Seunghyun Lee, Yi Xu, Je Min Yu, Seon Woo Hwang, Thomas F Jaramillo, Ji-Wook Jang, Seungho Cho, Homogeneously Mixed Cu–Co Bimetallic Catalyst Derived from Hydroxy Double Salt for Industrial-Level High-Rate Nitrate-to-Ammonia Electrosynthesis, *Journal of the American Chemical Society*, (2024).
DOI: 10.1021/jacs.4c07061

(273) Kyra MK Yap, Aisulu Aitbekova, Matthew Salazar, Tobias A Kistler, Melanie Rodríguez Pabón, Magel P Su, Nicholas B Watkins, Sang-Won Lee, Peter Agbo, Adam Z Weber, Jonas C Peters, Theodor Agapie, Adam C Nielander, Harry A Atwater, Thomas F Jaramillo, Alexis T Bell, CO_2 Conversion to Butene via a Tandem Photovoltaic–Electrochemical/Photothermocatalytic Process: A Co-design Approach to Coupled Microenvironments, *ACS Energy Letters*, (2024).
DOI: 10.1021/acsenergylett.4c01866

(272) Melissa E Kreider, Haoran Yu, Luigi Osmieri, Makenzie R Parimuha, Kimberly S Reeves, Daniela H Marin, Ryan T Hannagan, Emily K Volk, Thomas F Jaramillo, James L Young, Piotr Zelenay, Shaun M Alia, Understanding the Effects of Anode Catalyst Conductivity and Loading on Catalyst Layer Utilization and Performance for Anion Exchange Membrane Water Electrolysis, *ACS Catalysis*, (2024).
DOI: 10.1021/acscatal.4c02932

(271) Shikai Liu, Yuheng Li, Di Wang, Shibo Xi, Haoming Xu, Yulin Wang, Xinzhe Li, Wenjie Zang, Weidong Liu, Mengyao Su, Katherine Yan, Adam C Nielander, Andrew B Wong, Jiong Lu, Thomas F Jaramillo, Lei Wang, Pieremanuele Canepa, Qian He, Alkali cation-induced cathodic corrosion in Cu electrocatalysts, *Nature Communications*, (2024).
DOI: 10.5281/zenodo.11106990

(270) Nishithan C Kani, Rohit Chauhan, Samuel A Olusegun, Ishwar Sharan, Anag Katiyar, David W House, Sang-Won Lee, Alena Jairamsingh, Rajan R Bhawnani, Dongjin Choi, Adam C Nielander, Thomas F Jaramillo, Hae-Seok Lee, Anil Oroskar, Vimal C Srivastava, Shishir Sinha, Joseph A Gauthier, Meenesh R Singh, Sub-volt conversion of activated biochar and water for H2 production near equilibrium via biochar-assisted water electrolysis, *Cell Reports Physical Science*, (2024).
DOI: 10.5281/zenodo.8059745

(269) Lingze Wei, Md Delowar Hossain, Gan Chen, Gaurav A Kamat, Melissa E Kreider, Junjie Chen, Katherine Yan, Zhenan Bao, Michal Bajdich, Michaela Burke Stevens, Thomas F Jaramillo, Tuning Two-Dimensional Phthalocyanine Dual Site Metal–Organic Framework Catalysts for the Oxygen Reduction Reaction, *Journal of the American Chemical Society*, (2024).
DOI: 10.1021/jacs.4c02229

(268) Ahmad Tayyebi, Rashmi Mehrotra, Muhibullah Al Mubarok, Jieun Kim, Mohammad Zafari, Meysam Tayebi, Dongrak Oh, Seong-hun Lee, Jesse E Matthews, Sang-Won Lee, Tae Joo Shin, Geunsik Lee, Thomas F Jaramillo, Sung-Yeon Jang, Ji-Wook Jang, Bias-free solar NH_3 production by perovskite-based photocathode coupled to valorization of glycerol, *Nature Catalysis*, (2024).
DOI: 10.1038/s41929-024-01133-4

(267) Wen Fu, Forrest P Hyler, Joel Sanchez, Thomas F Jaramillo, Jesús M Velázquez, Lizhi Tao, R David Britt, Biogenic Manganese Oxide Synthesized by a Marine Bacterial Multicopper Oxidase MnxG Reveals Oxygen Evolution Activity, *ACS Catalysis*, (2024).
DOI: 10.1021/acscatal.3c06119

(266) Victoria M Ehlinger, Dong Un Lee, Tiras Y Lin, Eric B Duoss, Sarah E Baker, Thomas F Jaramillo, Christopher Hahn, Modeling Planar Electrodes and Zero-Gap Membrane Electrode Assemblies for CO_2 Electrolysis, *ChemElectroChem*, (2024).
DOI: 10.1002/celc.202400227

(265) Shyam Deo, Melissa E Kreider, Gaurav Kamat, McKenzie Hubert, José A Zamora Zeledón, Lingze Wei, Jesse Matthews, Nathaniel Keyes, Ishaan Singh, Thomas F Jaramillo, Frank Abild-Pedersen, Michaela Burke Stevens, Kirsten Winther, Johannes Voss, Interpretable Machine Learning Models for Practical Antimonate Electrocatalyst Performance, *ChemPhysChem*, (2024).
DOI: 10.1039/D3EE04235A

(264) Niklas H Deissler, J Bjarke V Mygind, Katja Li, Valerie A Niemann, Peter Benedek, Valentin Vinci, Shaofeng Li, Xianbiao Fu, Peter CK Vesborg, Thomas F Jaramillo, Jakob Kibsgaard, Jakub Drnec, Ib Chorkendorff, Operando investigations of the solid electrolyte interphase in the lithium mediated nitrogen reduction reaction, *Energy & Environmental Science*, (2024).
DOI: 10.1039/D3EE04235A

(263) K.M.K. Yap, W.J. Wei, M. Rodríguez Pabón, A.J. King, J.C. Bui, L. Wei, S.-W. Lee, A.Z. Weber, A.T. Bell, A.C. Nielander, T.F. Jaramillo, "Modeling diurnal and annual ethylene generation from solar-driven electrochemical CO_2 reduction devices," *Energy & Environmental Science*, (2024).
DOI: 10.1039/D4EE00545G

(262) V.M. Ehlinger, D.U. Lee, T.Y. Lin, E.B. Duoss, S.E. Baker, T.F. Jaramillo, C. Hahn, "Modeling Planar Electrodes and Zero-Gap Membrane Electrode Assemblies for CO_2 Electrolysis," *ChemElectroChem*, (2024).
DOI: 10.1002/celc.202300566

(261) J.C. Bui, E.W. Lees, D.H. Marin, T.N. Stovall, L. Chen, A. Kusoglu, A.C. Nielander, T.F. Jaramillo, S.W. Boettcher, A.T. Bell, A.Z. Weber, "Multi-scale physics of bipolar membranes in electrochemical processes," *Nature Chemical Engineering*, (2024).
DOI: 10.1038/s44286-023-00009-x

(260) X. Fu, V.A. Niemann, Y. Zhou, S. Li, K. Zhang, J.B. Pedersen, M. Saccoccio, S.Z. Andersen, K. Enemark-Rasmussen, P. Benedek, A. Xu, N.H. Deissler, J.B.V. Mygind, A.C. Nielander, J. Kibsgaard, P.K. Vesborg, J.K Nørskov, T.F Jaramillo, I. Chorkendorff, "Calcium-mediated nitrogen reduction for electrochemical ammonia synthesis," *Nature Materials*, (2024).
DOI: 10.1038/s41563-023-01702-1

2023

(259) I. Rios Amador, R.T. Hannagan, D.H. Marin, J.T. Perryman, C. Rémy, M.A. Hubert, G.A. Lindquist, L. Chen, M. Burke Stevens, S.W. Boettcher, A.C. Nielander, T.F. Jaramillo, "Protocol for assembling and operating bipolar membrane water electrolyzers," *STAR Protocols*, (2023).
10.1016/j.xpro.2023.102606

(258) D.U. Lee, B. Joensen, J. Jenny, V.M. Ehlinger, S. Lee, K. Abiose, Y. Xu, A. Sarkar, T.Y. Lin, C. Hahn, T.F. Jaramillo, "Controlling Mass Transport in Direct Carbon Dioxide Zero-Gap Electrolyzers via Cell Compression," *ACS Sustainable Chemistry & Engineering*, (2023).
10.1021/acssuschemeng.3c05494.

(257) J.C. Douglin, J.A.Z. Zeledón, M.E. Kreider, R.K. Singh, M.B. Stevens, T.F. Jaramillo, D.R. Dekel, "High-performance ionomerless cathode anion-exchange membrane fuel cells with ultra-low-loading Ag–Pd alloy electrocatalysts," *Nature Energy*, (2023).
DOI: 10.6084/m9.figshare.22141169

(256) S.J. Blair, A.C. Nielander, K.H. Stone, M.E. Kreider, V.A. Niemann, P. Benedek, E.J. McShane, A. Gallo, T.F. Jaramillo, "Development of a versatile electrochemical cell for in situ grazing-incidence X-ray diffraction during non-aqueous electrochemical nitrogen reduction," *Journal of Synchrotron Radiation*, (2023).
DOI: 10.1107/S1600577523006331

(255) W. Drisdell, S.H. Lee, J.A. Acosta, D. Lee, D. Larson, H. Li, J. Chen, S. Blair, A. Gallo, H. Zheng, C. Tassone, T.F. Jaramillo, "Structural Transformation and Degradation of Cu Nanocatalysts during Electrochemical CO_2 Reduction Reaction," *Research Square*, (2023).
DOI: 10.21203/rs.3.rs-3204416/v1

(254) Y. Qiao, G. Kastlunger, R.C. Davis, C.A.G. Rodriguez, A. Vishart, W. Deng, Q. Xu, S. Li, P. Benedek, J. Chen, J. Schröder, J. Perryman, D.U. Lee, T.F. Jaramillo, I. Chorkendorff, B. Seger, "Mechanistic Insights into Aldehyde Production from Electrochemical CO2 Reduction on CuAg Alloy via Operando X-ray Measurements," *ACS Catalysis*, (2023).
DOI: 10.1021/acscatal.3c01009

(253) J. Schröder, J.A.Z. Zeledón, G.A. Kamat, M.E. Kreider, L. Wei, A.S. Mule, A.Torres, K. Yap, D. Sokaras, A. Gallo, M.B. Stevens, T.F. Jaramillo, "Tracking the Dynamics of a Ag-MnOx Oxygen Reduction Catalyst Using In Situ and Operando X-ray Absorption Near-Edge Spectroscopy," *ACS Energy Letters*, (2023).
DOI: 10.1021/acsenergylett.3c00823

(252) H. Gong, L. Wei1, S. C, Z. Chen, T.F. Jaramillo, Z. Bao, "Carbon Flowers as Electrocatalysts for the Reduction of Oxygen to Hydrogen Peroxide," *Nano Research*, (2023).
DOI: 10.1007/s12274-023-5903-8

(251) J.E. Avilés Acosta, J.C. Lin, D. Lee, T.F. Jaramillo, C. Hahn, "Electrochemical Flow Reactor Design Allows Tunable Mass Transport Conditions for Operando Surface Enhanced Infrared Absorption Spectroscopy," *ChemCatChem*, (2023).
DOI: 10.1002/cctc.202300520

(250) K. M.K. Yap, S.-W Lee, M.A. Steiner, J.E. Avilés Acosta, D. Kang, D. Kim, E.L. Warren, A.C. Nielander,T.F. Jaramillo, "A framework for understanding efficient diurnal CO2 reduction using Si and GaAs photocathodes," *Chem Catalysis*, (2023).
DOI: 10.1016/j.checat.2023.100641

(249) V.A. Niemann, P. Benedek, J. Guo, Y. Xu, S.J. Blair, E.R. Corson, A.C. Nielander, T.F. Jaramillo, W.A. Tarpeh, "Co-designing Electrocatalytic Systems with Separations To Improve the Sustainability of Reactive Nitrogen Management," *ACS Catalysis*, (2023).
DOI: 10.1021/acscatal.3c00933

(248) D.H. Marin, J.T. Perryman, M.A. Hubert, G.A Lindquist, L. Chen, A.M. Aleman, G.A. Kamat, V.A. Niemann, M.B. Stevens, Y.N. Regmi, S.W. Boettcher, A.C. Nielander, T.F. Jaramillo, "Hydrogen production with seawater-resilient bipolar membrane electrolyzers," *Joule*, (2023).
DOI: 10.1016/j.joule.2023.03.005

(247) L. Wei, M.D. Hossain, M.J. Boyd, J.E. Avilés Acosta, M.E. Kreider, A.C. Nielander, M.B. Stevens, T.F. Jaramillo, M. Bajdich, C. Hahn, "Insights into Active Sites and Mechanisms of Benzyl Alcohol Oxidation on Nickel–Iron Oxyhydroxide Electrodes," *ACS Catalysis*, (2023).
DOI: 10.1021/acscatal.2c05656

2022

(246) M.E. Kreider, G.A. Kamat, J.A. Zamora Zeledón, L. Wei, D. Sokaras, A. Gallo, M.B. Stevens, T.F. Jaramillo, "Understanding the Stability of Manganese Chromium Antimonate Electrocatalysts through Multimodal In Situ and Operando Measurements," *Journal of the American Chemical Society*, (2022).
DOI: 10.1021/jacs.2c08600

(245) E.J. McShane, P. Benedek, V.A. Niemann, S. J. Blair, G.A. Kamat, A. C. Nielander, T.F. Jaramillo, M. Cargnello, "A Versatile Li0.5FePO4 Reference Electrode for Nonaqueous Electrochemical Conversion Technologies," *ACS Energy Letters*, (2022).
DOI: 10.1021/acsenergylett.2c02190.

(244) D. Corral, D.U Lee, V.M. Ehlinger, S. Nitopi, J.E. Avilés Acosta, L. Wang, A.J. King, J.T. Feaster, Y. Lin, A.Z. Weber, S.E. Baker, E.B. Duoss, V.A. Beck, C. Hahn, T.F. Jaramillo, "Bridging knowledge gaps in liquid-and vapor-fed CO2 electrolysis through active electrode area," *Chem Catalysis*, (2022).
DOI: 10.1016/j.checat.2022.09.017

(243) M.E. Kreider, GT.K.K. Gunasooriya, Y. Liu, J.A. Zamora Zeledón, E. Valle, C. Zhou, J.H. Montoya, A. Gallo, R. Sinclair, J.K. Nørskov, M.B. Stevens, T.F. Jaramillo, "Strategies for Modulating the Catalytic Activity and Selectivity of Manganese Antimonates for the Oxygen Reduction Reaction," *ACS Catalysis*, (2022).
DOI: 10.1021/acscatal.2c01764

(242) S.M. Dull, O. Vinogradova, S. Xu, D.M. Koshy, P.E. Vullum, J. Torgersen, S. Kirsch, V. Viswanathan, T.F. Jaramillo, F.B. Prinz, "Alloyed Pt–Zn Oxygen Reduction Catalysts for Proton Exchange Membrane Fuel Cells," *ACS Applied Energy Materials*, (2022).
DOI: 10.1021/acsaem.2c00816

(241) J.A. Zamora Zeledón, A. Jackson, M.B. Stevens, G.A. Kamat, T.F. Jaramillo, "Methods—A Practical Approach to the Reversible Hydrogen Electrode Scale," *Journal of the Electrochemical Society*, (2022).
DOI: 10.1149/1945-7111/ac71d1/meta

(240) S.H. Choi, M.E. Kreider, A.C. Nielander, M.B. Stevens, G. Kamat, J.E. Koo, K.H. Bae, H. Kim, I.Y. Yoon, B.U. Yoon, K. Hwang, D.U. Lee, T.F. Jaramillo, "Origins of Wear-Induced Tungsten Corrosion Defects in Semiconductor Manufacturing during Tungsten Chemical Mechanical Polishing," *Applied Surface Science*, (2022).
DOI: 10.1016/j.apsusc.2022.153767

(239) Y.R. Lin, D.U. Lee, S. Tan, D.M. Koshy, T.Y. Lin, L. Wang, D. Corral, J.E. Avilés Acosta, J.A. Zamora Zeledon, V.A. Beck, S.E. Baker, E.B. Duoss, C. Hahn, T.F. Jaramillo, "Vapor-Fed Electrolyzers for Carbon Dioxide Reduction Using Tandem Electrocatalysts: Cuprous Oxide Coupled with Nickel-Coordinated Nitrogen-Doped Carbon," *Advanced Functional Materials*, (2022).
DOI: 10.1002/adfm.202113252

(238) S.J. Blair, M. Doucet, J.F. Browning, K. Stone, H. Wang, C. Halbert, J.E. Avilés Acosta, J.A. Zamora Zeledón, A.C. Nielander, A. Gallo, T.F. Jaramillo, "Lithium-Mediated Electrochemical Nitrogen Reduction: Tracking Electrode–Electrolyte Interfaces via Time-Resolved Neutron Reflectometry," *ACS Energy Letters*, (2022).
DOI: 10.1021/acsenergylett.1c02833

(237) J. Resasco, F. Abild-Pedersen, C. Hahn, Z. Bao, M. Koper, T.F. Jaramillo, "Enhancing the connection between computation and experiments in electrocatalysis," *Nature Catalysis*, (2022).
DOI: 10.1038/s41929-022-00789-0

(236) G.K.K Gunasooriya, M.E. Kreider, Y. Liu, J.A. Zamora Zeledón, Z. Wang, E. Valle, A. Yang, A. Gallo, R. Sinclair, M.B Stevens, T. F. Jaramillo, J.K. Nørskov, "First-Row Transition Metal Antimonates for the Oxygen Reduction Reaction," *ACS Nano*, (2022).
DOI: 10.1021/acsnano.2c00420

(235) G. Kastlunger, L. Wang, N. Govindarajan, H.H. Heenen, S. Ringe, T.F. Jaramillo, C. Hahn, K. Chan, "Using pH Dependence to Understand Mechanisms in Electrochemical CO Reduction," *ACS Catalysis*, (2022).
DOI: 10.1021/acscatal.1c05520

(234) E. Valle, M.S. Duyar, J.L. Snider, S.K. Regli, M. Rønning, A. Gallo, T.F. Jaramillo, "In Situ Studies of the Formation of MoP Catalysts and Their Structure under Reaction Conditions for

Higher Alcohol Synthesis: The Role of Promoters and Mesoporous Supports," *Journal of Physical Chemistry C*, (2022).
DOI: 10.1021/acs.jpcc.2c00837

(233) G.A. Kamat, J.A. Zamora Zeledón, G.T.K.K. Gunasooriya, S.M. Dull, J.T. Perryman, J.K. Nørskov, M.B. Stevens, T.F. Jaramillo, "Acid anion electrolyte effects on platinum for oxygen and hydrogen electrocatalysis," *Communications Chemistry*, (2022).
DOI: 10.1038/s42004-022-00635-1

(232) D. Wakerley, S. Lamaison, J. Wicks, A. Clemens, J. Feaster, D. Corral, S.A. Jaffer, A. Sarkar, M. Fontecave, E.B. Duoss, S. Baker, E.H. Sargent, T.F. Jaramillo, C. Hahn, "Gas diffusion electrodes, reactor designs and key metrics of low-temperature CO2 electrolysers," *Nature Energy*, (2022).
DOI: 10.1038/s41560-021-00973-9

(231) M.A. Hubert, A. Gallo, Y. Liu, E. Valle, J. Sanchez, D. Sokaras, R. Sinclair, L.A. King, T.F. Jaramillo, "Characterization of a Dynamic Y_2Ir2O_7 Catalyst during the Oxygen Evolution Reaction in Acid," *The Journal of Physical Chemistry C*, (2022).
DOI: 10.1021/acs.jpcc.1c07760

(230) M. Ben-Naim, C.W. Aldridge, M.A. Steiner, A.C. Nielander, T.G. Deutsch, J.L. Young, T.F. Jaramillo, "Demonstration of photoreactor platform for on-sun unassisted photoelectrochemical hydrogen generation with tandem III–V photoelectrodes," *Chem Catalysis*, (2022).
DOI: 10.1016/j.checat.2021.12.013

(229) M. Ben-Naim, C.W. Aldridge, M.A. Steiner, R.J. Britto, A.C. Nielander, L.A. King, T.G. Deutsch, J.L. Young, T.F. Jaramillo, "Engineering Surface Architectures for Improved Durability in III–V Photocathodes," *ACS Applied Materials & Interfaces*, (2022).
DOI: 10.1021/acsami.1c18938

(228) J.A. Zamora Zeledón, G.T.K.K. Gunasooriya, G.A. Kamat, M.E. Kreider, M. Ben-Naim, M.A. Hubert, J.E. Avilés Acosta, J.K. Nørskov, M.B. Stevens, T.F. Jaramillo, "Engineering metal–metal oxide surfaces for high-performance oxygen reduction on Ag–Mn electrocatalysts," *Energy & Environmental Science*, (2022).
DOI: 10.1039/D2EE00047D

(227) S. Lamaison, D. Wakerley, F. Kracke, T. Moore, L. Zhou, D. Lee, L. Wang, M.A. Hubert, J.E. Aviles Acosta, J.M. Gregoire, E.B. Duoss, S.E. Baker, V.A. Beck, A.M. Spormann, M. Fontecave, C. Hahn, T.F. Jaramillo, "Designing a Zn–Ag Catalyst Matrix and Electrolyzer System for CO2 Conversion to CO and Beyond," *Advanced Materials*, (2021).
DOI: 10.1002/adma.202103963

(226) Y. Kim, S. Xu, J. Park, A.L. Dadlani, O. Vinogradova, D. Krishnamurthy, M. Orazov, D. Lee, S. Dull, P. Schindler, H.S. Han, Z. Wang, T. Graf, T.D. Schladt, J.E. Mueller, R. Sarangi, R. Davis, V. Viswanathan, T.F. Jaramillo, D.C. Higgins, F.B. Prinz, "Improving intrinsic oxygen reduction activity and stability: Atomic layer deposition preparation of platinum-titanium alloy catalysts," *Applied Catalysis B: Environmental*, (2022).
DOI: 10.1016/j.apcatb.2021.120741

(225) M.A. Hubert, L.A. King, T.F. Jaramillo, "Evaluating the Case for Reduced Precious Metal Catalysts in Proton Exchange Membrane Electrolyzers," *ACS Energy Letters*, (2022).
DOI: 10.1021/acsenergylett.1c01869

2021

(224) D.M. Koshy, S.A. Akhade, A. Shugar, K. Abiose, J. Shi, S. Liang, J.S. Oakdale, S.E. Weitzner, J.B. Varley, E.B. Duoss, S.E. Baker, C. Hahn, Z. Bao, T.F. Jaramillo, "Chemical Modifications of Ag Catalyst Surfaces with Imidazolium Ionomers Modulate H2 Evolution Rates during Electrochemical CO2 Reduction" *Journal of the American Chemical Society*, (2021).
DOI: 10.1021/jacs.1c06212

(223) Y.F. Nishimura, H. Peng, S. Nitopi, M. Bajdich, L.Wang, C.G. Morales-Guio, F. Abild-Pedersen, T.F. Jaramillo, C. Hahn, "Guiding the Catalytic Properties of Copper for Electrochemical CO2 reduction by Metal Atom Decoration," *ACS Applied Materials & Interfaces*, (2021).
DOI: 10.1021/acsami.1c09128

(222) S.A. Akhade, B.S. Jayathilake, S.E. Weitzner, H.V. Eshelman, J. Hamilton, J.T. Feaster, D.W. Wakerley, L. Wang, S. Lamaison, D. Lee, C. Hahn, T.F. Jaramillo, E.B. Duoss, S.E. Baker, and J.B. Varley, "Electrolyte-Guided Design of Electroreductive CO Coupling on Copper Surfaces," *ACS Applied Energy Materials*, (2021).
DOI: 10.1021/acsaem.1c01427

(221) A.T. Landers, H. Peng, D.M. Koshy, S.H. Lee, J.T. Feaster, J.C. Lin, J.W. Beeman, D. Higgins, J. Yano, W.S. Drisdell, R.C. Davis, M. Bajdich, F. Abild-Pedersen, A. Mehta, T.F. Jaramillo, C. Hahn, "Dynamics and Hysteresis of Hydrogen Intercalation and Deintercalation in Palladium Electrodes: A Multimodal In Situ X-ray Diffraction, Coulometry, and Computational Study," *Chemistry of Materials*, (2021).
DOI: 10.1021/acs.chemmater.1c00291

(220) J.A. Zamora Zeledón, G.A. Kamat, G.T. Kasun Kalhara Gunasooriya, J.K. Nørskov, M.B. Stevens, T.F. Jaramillo, "Probing the Effects of Acid Electrolyte Anions on Electrocatalyst Activity and Selectivity for the Oxygen Reduction Reaction, *ChemElectroChem*, (2021).
DOI: 10.1002/celc.202100500

(219) D. Upham, M. Orazov, T.F. Jaramillo, "Phosphate-passivated mordernite for tandem-catalytic conversion of syngas to ethanol or acetic acid," *Journal of Catalysis*, (2021).
DOI: 10.1016/j.jcat.2021.04.029

(218) M. Ben-Naim, Y. Liu, M.B. Stevens, K. Lee, M.R. Wette, A. Boubnov, A.A. Trofimov, A.V. Ievlev, A. Belianinov, R.C. Davis, B.M. Clemens, S.R. Bare, Y. Hikita, H.Y. Hwangm D.C. Higgins, R. Sincleair, T.F. Jaramillo, Understanding Degredation Mechanisms in SrIrO3 Oxygen Evolution Electrocatalysis: Chemical and Structural Microscopy at the Nanoscale," *Advanced Functional Materials*, (2021).
DOI: 10.1002/adfm.202101542

(217) S. Xu, Z. Wang, S. Dull, Y. Liu, D. Lee, J.S.L. Pacheco, M. Orazov, P.E. Vullum, A.L. Dadlani, O. Vinogradova, P. Schindler, Q. Tam, T.D. Schladt, J.E. Mueller, S. Kirsch, G. Huebner, D. Higgins, J. Torgersen, V. Viswanathan, T.F. Jaramillo, F.B. Prinz, "Direct Integration of Strained-Pt Catalysts into Proton-Exchange-Membrane Fuel Cells with Atomic Layer Deposition," *Advanced Materials*, (2021).
DOI: 10.1002/adma.202007885

(216) L. Wang, H. Peng, S. Lamaison, Z. Qi, D.M. Koshy, M.B. Stevens, D. Wakerley, J.A.Z. Zeledon, L.A. King, L. Zhou, Y. Lai, M. Fontecave, J. Gregoire, F. Abild-Pedersen, T.F. Jaramillo, C. Hahn, "Bimetallic effects of Zn-Cu electrocatalysts enhance activity and selectivity for the conversion of CO2 to CO," *Chem Catalysis*, (2021).
DOI: 10.1016/j.checat.2021.05.006

(215) A.T. Landers, D.M. Koshy, S.H. Lee, W.S. Drisdell, R.C. Davis, C. Hahn, A. Mehta, T.F. Jaramillo, "A refraction correction for buried interfaces applied to in situ grazing-incidence X-ray diffraction studies on Pd electrodes," *Journal of Synchrotron Radiation*, (2021).
DOI: 10.1107/S1600577521001557

(214) J. Sanchez, M.B. Stevens, A.R. Young, A. Gallo, M. Zhao, Y. Liu, M.V. Ramos-Garcés, M. Ben-Naim, J. L. Colón, R. Sinclair, L.A. King, M. Bajdich, T.F. Jaramillo, "Isolating the Electrocatalytic Activity of a Confined NiFe Motif within Zirconium Phosphate," *Advanced Energy Materials*, (2021).
DOI: 10.1002/aenm.202003545

(213) D.M. Koshy, S. Nathan, A. Asundi, A. Abdellah, S. Dull, D. Cullen, D. Higgins, Z. Bao, S. Bent, T. F. Jaramillo, "Bridging thermal catalysis and electrocatalysis: Catalyzing CO2 conversion with carbon-based materials," *Angewandte Chemie International Edition*, (2021).

DOI: 10.1002/anie.202101326

(212) D. Corral*, J.T. Feaster*, S. Sobhani, J.R. DeOtte, D.U. Lee, A.A. Wong, J. Hamilton, V.A. Beck, A. Sarkar, C. Hahn, T.F. Jaramillo, S.E. Baker, E.B. Duoss, "Advanced manufacturing for electrosynthesis of fuels and chemicals from CO2," *Energy & Environmental Science*, (2021).
DOI:10.1039/D0EE03679J

(211) J.A. Zamora Zeledón, M.B. Stevens, G.T. Kasun Klahara Gunasooriya, A. Gallo, A.T. Landers, M.E. Kreider, C. Hahn, J.K. Nørskov, T.F. Jaramillo, "Tuning the electronic structure of Ag-Pd alloys to enhance performance for alkaline oxygen reduction," *Nature Communications*, (2021).
DOI: 10.1038/s41467-021-20923-z

(210) S.M. Dull, S. Xu, T. Goh, D.U. Lee, D. Higgins, M. Orazov, D.M. Koshy, P.E. Vullum, S. Kirsch, G. Huebner, J. Torgersen, T.F. Jaramillo, F.B. Prinz, "Bottom-Up Fabrication of Oxygen Reduction Electrodes with Atomic Layer Deposition for High-Power-Density PEMFCs," *Cell Reports Physical Science*, (2021).
DOI: 10.1016/j.xcrp.2020.100297

(209) D.W. Palm, C.P. Muzzillo, M. Ben-Naim, I. Khan, N. Gaillard, T.F. Jaramillo, "Tungsten oxide-coated copper gallium selenide sustains long-term solar hydrogen evolution," *Sustainable Energy & Fuels*, (2021).
DOI: 10.1039/D0SE90059A

2020

(208) A. Winiwarter, M.J. Boyd, S.B. Scott, D.C. Higgins, B. Seger, I. Chorkendorff, T.F. Jaramillo, "CO as a Probe Molecule to Study Surface Adsorbates during Electrochemical Oxidation of Propene," *ChemElectroChem*, (2016).
DOI: 10.1002/celc.202001162

(207) S.H. Lee, J.C. Lin, M. Farmand, A.T. Landers, J.T. Feaster, J.E. Avilés Acosta, J.W. Beeman, Y. Ye, J. Yano, A. Mehta, R.C. Davis, T. F. Jaramillo, C. Hahn, W.S. Drisdell, "Oxidation State and Surface Reconstruction of Cu under CO2 Reduction Conditions from In Situ X-ray Characterization," *Journal of the American Chemical Society*, (2020).
DOI: 10.1021/jacs.0c10017

(206) M.B. Stevens, M.E. Kreider, A.M. Patel, Z. Wang, Y. Liu, B.M. Gibbons, M.J. Statt, A.V. Ievlev, R. Sinclair, A. Mehta, R.C. Davis, J.K. Nørskov, A. Gallo, L.A. King, T.F. Jaramillo, "Identifying and Tuning the In Situ Oxygen-Rich Surface of Molybdenum Nitride Electrocatalysts for Oxygen Reduction," *ACS Applied Energy Materials*, (2020).
DOI: 10.1021/acsaem.0c02423

(205) L. Zeng, N.E. Richey, D.W. Palm, I. Oh, J. Shi, C. MacIsaac, T.F. Jaramillo, S.F. Bent, "Modified atomic layer deposition of MoS2 thin films," *Journal of Vacuum Science & Technology A*, (2020).
DOI: 10.1116/6.0000641

(204) I.B. Alvarez, Y. Wu, J. Sanchez, Y. Ge, M.R. Garces, T. Chu, T.F. Jaramillo, J.L. Colón, D. Villagran, "Cobalt Porphyrin Intercalation into Zirconium Phosphate Layers for Electrochemical Water Oxidation," *Sustainable Energy & Fuels*, (2020).
DOI: 10.1039/D0SE01134G

(203) M.A. Hubert, A.M. Patel, A. Gallo, Y. Liu, E. Valle, M. Ben-Naim, J. Sanchez, D. Sokaras, R. Sinclair, J.K. Nørskov, L.A. King, M. Bajdich, T.F. Jaramillo, "Acidic Oxygen Evolution Reaction Activity-Stability Relationships in Ru-Based Pyrochlores," *ACS Catalysis*, (2020).
DOI: 10.1021/acscatal.0c02252

(202) D.M. Koshy, A.T. Landers, D.A. Cullen, A.V. levlev, H.M. Meyer III, C. Hahn, Z. Bao, T.F. Jaramillo, "Direct Characterization of Atomically Dispersed Catalysts: Nitrogen-Coordinated Ni Sites in Carbon-Based Materials for CO2 Electroreduction," *Advanced Energy Materials*, (2020).
DOI: 10.1002/aenm.202001836

(201) J. Park, Z. Chen, R.A. Flores, G. Wallnerström, A. Kulkarni, J.K. Nørskov, T.F. Jaramillo, Z. Bao, "Two-Dimensional Conductive Ni-HAB as a Catalyst for the Electrochemical Oxygen Reduction Reaction," *ACS Applied Materials & Interfaces*, 12 (2020) 39074-39081. DOI: 10.1021/acsami.0c09323

(200) G. Chen, M. Burke Stevens, Y. Liu, L.A. King, J. Park, T.R. Kim, R. Sinclair, T.F. Jaramillo, Z. Bao, "Nanosized Zirconium Porphyrinic Metal–Organic Frameworks that Catalyze the Oxygen Reduction Reaction in Acid," *Small Methods*, (2020) 2000085. DOI: 10.1002/smtd.202000085

(199) M. Ben-Naim, R.J. Britto, C.W. Aldridge, R. Mow, M.A. Steiner, A.C. Nielander, L.A. King, D.J. Friedman, T.G. Deutsch, J.L. Young, T. F. Jaramillo, "Addressing the Stability Gap in Photoelectrochemistry: Molybdenum Disulfide Protective Catalysts for Tandem III-V Unassisted Solar Water Splitting," *ACS Energy Letters*, 5 (2020) 2631-2640. DOI: 10.1021/acsenergylett.0c01132

(198) A.C. Nielander, S.J. Blair, J.M. McEnaney, J.A. Schwalbe, S. Taheri, L. Wang, S. Yang, M. Cargnello, T.F. Jaramillo Readily Constructed Glass Piston Pump for Gas Recirculation *ACS Omega*, 5 (2020) 16455-16459. DOI: 10.1021/acsomega.0c00742

(197) M.S. Duyar, A. Gallo, J.L. Snider, T.F. Jaramillo Low-pressure methanol synthesis from CO_2 over metal-promoted Ni-Ga intermetallic catalysts, *Journal of CO_2 Utilization*, 39 (2020) 101151. DOI: 10.1016/j.jcou.2020.03.001

(196) A. Gallo, J.L. Snider, D. Sokaras, D. Nordlund, T. Kroll, H. Ogasawara, L. Kovarik, M.S. Duyar, T.F. Jaramillo, "Ni_5Ga_3 catalysts for CO_2 reduction to methanol: Exploring the role of Ga surface oxidation/reduction on catalytic activity," *Applied Catalysis B: Environmental*, 267 (2020) 118369. DOI: 10.1016/j.apcatb.2019.118369

(195) M.E. Kreider, M.B. Stevens, Y. Liu, A.M. Patel, M.J. Statt, B.M. Gibbons, A. Gallo, M. Ben Naim, A. Mehta, R.C. Davis, A.V. Levlev, J.K. Norskov, R. Sinclair, L.A. King, T.F. Jaramillo "Nitride or Oxynitride? Elucidating the Composition–Activity Relationships in Molybdenum Nitride Electrocatalysts for the Oxygen Reduction Reaction," *Chemistry of Materials*, 32 (2020) 2946-2960. DOI: 10.1021/acs.chemmater.9b05212

(194) B.M. Gibbons, M. Wette, M.B. Stevens, R.C. Davis, S. Siahrostami, M. Kreider, A. Mehta, D.C. Higgins, B.M. Clemens, T.F. Jaramillo, "In Situ X-Ray Absorption Spectroscopy Disentangles the Roles of Copper and Silver in a Bimetallic Catalyst for the Oxygen Reduction Reaction," *Chemistry of Materials*, 5 (2020) 1819-1827. DOI: 10.1021/acs.chemmater.9b03963

(193) C. Hahn, T.F. Jaramillo Using Microenvironments to Control Reactivity in CO_2 Electrocatalysis *Joule*, 4 (2020) 292-274. DOI: 10.1016/j.joule.2020.01.017

(192) J.M McEnaney, S.J. Blair, A.C. Nielander, J.A. Schwalbe, D.M. Koshy, M. Cargnello, T.F. Jaramillo, "Electrolyte Engineering for Efficient Electrochemical Nitrate Reduction to Ammonia on a Titanium Electrode," *ACS Sustainable Chemistry & Engineering*, 8 (2020) 2672-2681. DOI: 10.1021/acssuschemeng.9b05983

(191) L. Wang, D.C. Higgins, Y. Ji, C.G. Morales-Guio, K. Chan, C. Hahn, T.F. Jaramillo, "Selective reduction of CO to acetaldehyde with CuAg electrocatalysts," *Proceedings of the National Academy of Sciences*, 117 (2020) 12572-12575. DOI: 10.1073/pnas.1821683117

(190) J.M. McEnaney, B.A. Rohr, A.C. Nielander, A.R. Singh, L.A. King, J.K. Nørskov, T.F. Jaramillo, "A cyclic electrochemical strategy to produce acetylene from CO 2, CH 4, or alternative carbon sources," *Sustainable Energy & Fuels*, 4 (2020) 2751-2759. DOI: 10.1039/C9SE00799G

(189) J.A. Schwalbe, M.J. Statt, C. Chosy, A.R. Singh, B.A. Rohr, A.C. Nielander, S.Z. Andersen, J.M. McEnaney, J.G. Baker, T.F. Jaramillo, J.K. Nørskov, M. Cargnello, "A Combined Theory-Experiment Analysis of the Surface Species in Lithium-Mediated NH_3 Electrosynthesis," *ChemElectroChem*, 7 (2020) 1542. DOI: 10.1002/celc.201902124

(188) M. Ben-Naim, D.W. Palm, A.L. Strickler, A.C. Nielander, J. Sanchez, L.A. King, D.C Higgins, T.F. Jaramillo, "A Spin Coating Method To Deposit Iridium-Based Catalysts onto Silicon for

Water Oxidation Photoanodes," *ACS Applied Materials & Interfaces*, 12 (2020) 5901-5908. DOI: 10.1021/acsami.9b20099

(187) D. Koshy, S. Chen, D. Un Lee, M.B. Stevens, A. Abdellah, S. Dull, G. Chen, D. Nordlund, A. Gallo, C. Hahn, D.C. Higgins, Z. Bao, T.F. Jaramillo, "Understanding the Origin of Highly Selective CO_2 Electroreduction to CO on Ni, N-doped Carbon Catalysts," *Angewandte Chemie International Edition*, 132 (2020) 4072-4079. DOI: 10.1002/anie.201912857

(186) S. Ringe, C.G. Morales-Guio, L.D. Chen, M. Fields, T.F. Jaramillo, C. Hahn, K. Chan, "Double layer charging driven carbon dioxide adsorption limits the rate of electrochemical carbon dioxide reduction on Gold," *Nature Communications*, 11 (2020) 1-11. DOI: 10.1038/s41467-019-13777-z

(185) M.V.Ramos-Garcés, J. Sanchez, K. La Luz-Rivera, D.E. Del Toro-Pedrosa, T.F. Jaramillo, J.L. Colón, "Morphology control of metal-modified zirconium phosphate support structures for the oxygen evolution reaction," *Dalton Transactions*, 49 (2020) 3892-3900. DOI: 10.1039/c9dt04135d

2019

(184) M. Aykol, J.S. Hummelshøj, A. Anapolsky, K. Aoyagi, M.Z. Bazant, T. Bligaard, R.D. Braatz, S. Broderick,D. Cogswell, J. Dagdelen, W. Drisdell, E. Garcia, K. Garikipati, V. Gavini, W.E. Gent, L. Giordano, C.P. Gomes, R. Gomez-Bombarelli, C.Balaji Gopal, J.M. Gregoire, J.C. Grossman, P. Herring, L. Hung, T.F. Jaramillo, L. King, H. Kwon,R. Maekawa, A.M. Minor, J.H. Montoya, T. Mueller, C. Ophus, K. Rajan, R. Ramprasad, B. Rohr, D. Schweigert, Y. Shao-Horn, Y. Suga, S.K. Suram, V.Viswanathan, J.F. Whitacre, A.P. Willard, O. Wodo, C. Wolverton, B.D. Storey, "The Materials Research Platform: Defining the Requirements from User Stories," *Matter*, (2019). DOI: 10.1016/j.matt.2019.10.024

(183) A. Gallo, J.L. Snider, D. Sokaras, D. Nordlund, T. Kroll, H. Ogasawara, L. Kovarik, M.S. Duyar, T.F. Jaramillo, "Ni_5Ga_3 catalysts for CO_2 reduction to methanol: Exploring the role of Ga surface oxidation/reduction on catalytic activity," *Applied Catalysis B: Environmental*, (2019). DOI: 10.1016/j.apcatb.2019.118369

(182) L.A. King, M.K.A. Hubert, C. Capuano, J. Manco, N. Danilovic, E. Valle, T.R. Hellstern, K. Ayers, T.F. Jaramillo, "A non-precious metal hydrogen catalyst in a commercial polymer electrolyte membrane electrolyser," *Nature Nanotechnology*, (2019). DOI: 10.1038/s41565-019-0550-7

(181) J.A. Gauthier, L.A. King, F.T. Stults, R.A. Flores, J. Kibsgaard, Y.N. Regmi, K. Chan, T.F. Jaramillo, "Transition Metal Arsenide Catalysts for the Hydrogen Evolution Reaction," *The Journal of Physical Chemistry C*, (2019). DOI: 10.1021/acs.jpcc.9b05738

(180) J. Sanchez, T.R. Hellstern, L.A. King, T.F. Jaramillo, "Surface Engineering of 3D Gas Diffusion Electrodes for High-Performance H_2 Production with Nonprecious Metal Catalysts," *Advanced Energy Materials*,1901824 (2019). DOI: 10.1002/aenm.201901824

(179) E. Boutin, M. Wang, J.C. Lin, M. Mesnage, D. Mendoza, B.Lassalle-Kaiser, C. Hahn, T.F. Jaramillo, M. Robert Aqueous Electrochemical Reduction of Carbon Dioxide and Carbon Monoxide into Methanol with Cobalt Phthalocyanine, *Angewandte Chemie International Edition*, 58 (2019). DOI: 10.1002/anie.201909257

(178) A.L. Strickler, R.A. Flores, L.A. King, J.K. Nørskov, M. Bajdich, T.F. Jaramillo, "Systematic Investigation of Iridium-Based Bimetallic Thin Film Catalysts for the Oxygen Evolution Reaction in Acidic Media," *ACS Applied Materials and Interfaces*,11,37,34059-34066 (2019). DOI: 10.1021/acsami.9b13697

(177) Y. Liu, M.E. Kreider, M.B. Stevens, L.A. King, T.F. Jaramillo, R. Sinclair, "Transmission Electron Microscopy (TEM) Studies on Nickel and Molybdenum Nitrides as Oxygen Reduction Catalysts," *Microscopy and Microanalysis*, 25,(Suppl 2),2072-2073 (2019). DOI: 10.1017/S1431927619011097

(176) M.J. Boyd, A.A. Latimer, C.F. Dickens, A.C. Nielander, C. Hahn, J.K. Nørskov, D.C. Higgins, T.F. Jaramillo, "Electro-Oxidation of Methane on Platinum under Ambient Conditions," *ACS Catalysis*,9,8,7578-7587 (2019). DOI: 10.1021/acscatal.9b01207

(175) A.L. Strickler, D. Higgins, T.F. Jaramillo, "Crystalline Strontium Iridate Particle Catalysts for Enhanced Oxygen Evolution in Acid," *ACS Applied Energy Materials*,2,8,5490-5498 (2019). DOI: 10.1021/acsaem.9b00658

(174) M.E. Kreider, A. Gallo, S. Back, Y. Liu, S. Siahrostami, D. Nordlund, R. Sinclair, J.K. Nørskov, L.A. King, T.F. Jaramillo Precious Metal-Free Nickel Nitride Catalyst for the Oxygen Reduction Reaction," *ACS Applied Materials and Interfaces*, (2019). DOI: 10.1021/acsami.9b07116

(173) R.J. Britto, J.L. Young, Y. Yang, M.A. Steiner, D.T. LaFehr, D.J. Friedman, M. Beard, T.G. Deutsch, T.F. Jaramillo, "Interfacial engineering of gallium indium phosphide photoelectrodes for hydrogen evolution with precious metal and non-precious metal based catalysts," *Journal of Materials Chemistry A*, (2019). DOI: 10.1039/C9TA05247J

(172) S.Z. Andersen, V. Čolić, S. Yang, J. A. Schwalbe, A.C. Nielander, J. M. McEnaney, K. Enemark-Rasmussen, J. G. Baker, A.R. Singh, B.A. Rohr, M. J. Statt, S.J. Blair, S. Mezzavilla, J. Kibsgaard, P.C.K. Vesborg, M. Cargnello, S.F. Bent, T.F. Jaramillo, I.E.L. Stephens, J.K. Norskov, and I. Chorkendorff, "A rigorous electrochemical ammonia synthesis protocol with quantitative isotope measurements," *Nature*, 570, 504-508 (2019).

(171) A.C. Nielander, J.M. McEnaney, J.A. Schwalbe, J.G. Baker, S.J. Blair, L. Wang, J.G. Pelton, S.F. Bent, M. Cargnello, I. Chorkendorff, and T.F. Jaramillo, "A Versatile Method for Ammonia Detection in a Range of Relevant Electrolytes Via Direct NMR Techniques," *ACS Catalysis*, 9, 5797-5802 (2019).

(170) M.J. Boyd, A.A. Latimer, C.F. Dickens, A.C. Nielander, C. Hahn, J.K. Norskov, D.C. Higgins, T.F. Jaramillo, "Electro-Oxidation of Methane on Platinum Under Ambient Conditions," *ACS Catalysis*, accepted and in press (2019).

(169) L. Wang, S. Nitopi, A.B. Wong, J. L. Snider, A.C. Nielander, C.G. Morales-Guio, M. Orazov, D.C. Higgins, C. Hahn, and T.F. Jaramillo, "Electrochemically converting carbon monoxide to liquid fuels by directing selectivity with electrode surface area, *Nature Catalysis*, accepted and in press (2019).

(168) S. Nitopi, E. Bertheussen, S.B. Scott, X. Liu, A.K. Engstfeld, S. Horch, B. Seger, I.E.L. Stephens, K. Chan, C. Hahn, J.K. Nørskov, T.F. Jaramillo, and I. Chorkendorff, "Progress and Perspectives of Electrochemical CO2 Reduction on Copper in Aqueous Electrolyte," *Chemical Reviews*, 119, 7610-7672 (2019).

(167) P. De Luna, C. Hahn, D. Higgins, S.A. Jaffer, T.F. Jaramillo, and E.H. Sargent, "What would it take for renewably powered electrosynthesis to displace petrochemical processes?" *Science*, 364, eaav3506 (2019).

(166) M.V. Ramos-Garcés, J. Sanchez, D.E. Del Toro-Pedrosa, I.B. Alvarez, Y. Wu, E. Valle, D. Villagrán, T.F. Jaramillo, and J.L. Colón, "Transition Metal-Modified Exfoliated Zirconium Phosphate as an Electrocatalyst for the Oxygen Evolution Reaction," *ACS Applied Energy Materials*, 2, 3561-3567 (2019).

(165) F. Kracke, A.B. Wong, K. Maegaard, J.S. Deutzmann, M.A. Hubert, C.Hahn, T.F. Jaramillo, and A.M. Spormann, "Robust and biocompatible catalysts for efficient hydrogen-driven microbial electrosynthesis," *Communications Chemistry*, 2, 45 (2019).

(164) E.L. Clark, S. Ringe, M. Tang, A. Walton, C. Hahn, T.F. Jaramillo, K. Chan, and A.T. Bell, "Influence of Atomic Surface Structure on the Activity of Ag for the Electrochemical Reduction of CO2 to CO," *ACS Catalysis*, 2, 45 (2019).

(163) J.L. Snider, V. Streibel, M. A. Hubert, T.S. Choksi, E. Valle, D.C. Upham, J. Schumann, M.S. Duyar, A. Gallo, F. Abild-Pedersen, and T.F. Jaramillo, "Revealing the synergy between oxide and alloy phases on the performance of bimetallic In-Pd catalysts for CO2 hydrogenation to methanol," *ACS Catalysis*, 9, 3399–3412 (2019).

(162) S.B. Scott, T.V. Hogg, AT. Landers, T. Maagaard, E. Bertheussen, J.C. Lin, R.C. Davis, J.W. Beeman, D. Higgins, W.S. Drisdell, C. Hahn, A. Mehta, B. Seger, T.F. Jaramillo, and I. Chorkendorf, "Absence of Oxidized Phases in Cu under CO Reduction Conditions," *ACS Energy Letters*, 4, 803–804 (2019).

(161) M. Farmand, A.T. Landers, J.C. Lin, J.T. Feaster, J.W. Beeman, Y. Ye, E.L. Clark, D. Higgins, J. Yano, R.C. Davis, A. Mehta, T.F. Jaramillo, C. Hahn, and W.S. Drisdell, "Electrochemical flow cell enabling operando probing of electrocatalyst surfaces by X-ray spectroscopy and diffraction," *Phys Chem Chem Phys*, 21, 5402-5408 (2019).

(160) IC. ten Have, E. Valle, A. Gallo, J.L. Snider, M. Duyar, T.F. Jaramillo, "Development of MoP catalysts for higher alcohol synthesis from syngas by exploiting support and promoter effects," *Energy Technology*, 7, 1801102 (2019).

(159) T.R. Hellstern, D.W. Palm, J. Carter, A.D. DeAngelis, K. Horsley, L. Weinhardt, W. Yang, M. Blum, N. Gaillard, C. Heske, and T.F. Jaramillo, "Molybdenum Disulfide Catalytic Coatings via Atomic Layer Deposition for Solar Hydrogen Production from Copper Gallium Diselenide Photocathodes," *ACS Applied Energy Materials*, 2, 1060–1066 (2019).

(158) T.R. Hellstern, A.C. Nielander, P. Chakthranont, L.A. King, J.J. Willis, S. Xu, C. MacIsaac, C. Hahn, S.F. Bent, F.B. Prinz, and T.F. Jaramillo, "Nanostructuring Strategies To Increase the Photoelectrochemical Water Splitting Activity of Silicon Photocathodes," *ACS Applied Nano Materials*, 2, 6-11 (2019).

(157) X. Liu, P. Schlexer, J. Xiao, Y. Ji, L. Wang, R.B. Sandberg, M. Tang, K.S. Brown, H. Peng, S. Ringe, C. Hahn, T.F. Jaramillo, J.K. Nørskov, and K. Chan, "pH effects on the electrochemical reduction of CO2 towards C2 products on stepped copper," *Nature Communications*, 10, 32 (2019).

(156) D.C. Higgins, C. Hahn, C. Xiang, T.F. Jaramillo, and A.Z. Weber, "Gas-Diffusion Electrodes for Carbon-Dioxide Reduction: A New Paradigm," *ACS Energy Letters*, 4, 317–324 (2019).

2018

(155) D. Higgins, A.T. Landers, Y. Ji, S. Nitopi, C.G. Morales-Guio, L. Wang, K. Chan, C. Hahn,and T.F. Jaramillo, "Guiding Electrochemical Carbon Dioxide Reduction toward Carbonyls Using Copper Silver Thin Films with Interphase Miscibility," *ACS Energy Letters*, 3, 2947–2955 (2018).

(154) C.G. Morales-Guio, E.R. Cave, S.A. Nitopi, J.T. Feaster, L. Wang, K.P. Kuhl, A. Jackson, N.C. Johnson, D.N. Abram, T. Hatsukade, C. Hahn, and T.F. Jaramillo, "Improved CO2 reduction activity towards C2+ alcohols on a tandem gold on copper electrocatalyst*," Nature Catalysis*, 1, 764–771 (2018).

(153) M.S. Duyar, C. Tsai, J.L. Snider, J.A. Singh, A. Gallo, J.S. Yoo, A.J. Medford, F. Abild-Pedersen, F. Studt, J. Kibsgaard, S.F. Bent, J.K. Nørskov, and T.F. Jaramillo, "A Highly Active Molybdenum Phosphide Catalyst for Methanol Synthesis from CO and CO2," *Angew. Chem.*, 130, 15265 (2018).

(152) S. Xu, Y. Kim, J. Park, D. Higgins, S.-J. Shen, P. Schindler, D. Thian, J. Provine, J. Torgersen, T. Graf, T.D. Schladt, M. Orazov, B.H. Liu, T.F. Jaramillo, and F.B. Prinz, "Extending the limits of Pt/C catalysts with passivation-gas-incorporated atomic layer deposition," *Nature Catalysis*, 1, 624–630 (2018).

(151) L. Wang, S.A. Nitopi, E. Bertheussen, M. Orazov, C.G. Morales-Guio, X. Liu, D.C. Higgins, K. Chan, J.K. Nørskov, C. Hahn, and T.F. Jaramillo, "Electrochemical Carbon Monoxide Reduction on Polycrystalline Copper: Effects of Potential, Pressure, and pH on Selectivity toward Multicarbon and Oxygenated Products," *ACS Catalysis*, 8, 7445–7454 (2018).

(150) S. Chen, Z. Chen, S. Siahrostami, D. Higgins, D. Nordlund, D. Sokaras, T.R. Kim, Y. Liu, X. Yan, E. Nilsson, R. Sinclair, J.K. Nørskov, T.F. Jaramillo, and Z. Bao, "Designing Boron Nitride

Islands in Carbon Materials for Efficient Electrochemical Synthesis of Hydrogen Peroxide," *J. Am. Chem. Soc.,* 140, 7851-7859 (2018).

(149) E.L. Clark, J. Resasco, A. Landers, J. Lin, L.-T. Chung, A. Walton, C. Hahn, T.F. Jaramillo, and A.T. Bell, "Data Acquisition Protocols and Reporting Standards for Studies of the Electrochemical Reduction of Carbon Dioxide," *ACS Catalysis,* 8, 6560–6570 (2018).

(148) D.T. Duong, Y. Tuchman, P. Chakthranont, P. Cavassin, R. Colucci, T.F. Jaramillo, A. Salleo, and G.C. Faria, "A Universal Platform for Fabricating Organic Electrochemical Devices," *Advanced Electronic Materials,* 4, 1800090 (2018).

(147) A.T. Landers, M. Fields, D.A. Torelli, J. Xiao, T.R. Hellstern, S.A. Francis, C. Tsai, J. Kibsgaard, N.S. Lewis, K. Chan, C. Hahn, and T.F. Jaramillo, "The Predominance of Hydrogen Evolution on Transition Metal Sulfides and Phosphides under CO2 Reduction Conditions: An Experimental and Theoretical Study," *ACS Energy Letters,* 3, 1450–1457 (2018).

(146) D. Higgins, M. Wette, B.M. Gibbons, S. Siahrostami, C. Hahn, M. Escudero-Escribano, M. García-Melchor, Z. Ulissi, R.C. Davis, A. Mehta, B.M. Clemens, J.K. Nørskov, and T.F. Jaramillo, "Copper Silver Thin Films with Metastable Miscibility for Oxygen Reduction Electrocatalysis in Alkaline Electrolytes," *ACS Applied Energy Materials,* 1, 1990–1999 (2018).

(145) P.-A. Gross, T.F. Jaramillo, and B. Pruitt, "Cyclic-Voltammetry-Based Solid-State Gas Sensor for Methane and Other VOC Detection," *Analytical Chemistry,* 90, 6102–6108 (2018).

(144) E.R. Cave, C. Shi, K.P. Kuhl, T. Hatsukade, D.N. Abram, C. Hahn, K. Chan, and T.F. Jaramillo, "Trends in the Catalytic Activity of Hydrogen Evolution during CO2 Electroreduction on Transition Metals," *ACS Catalysis,* 8, 3035–3040 (2018).

(143) Z. Lu, G. Chen, S. Siahrostami, Z. Chen, K. Liu, J. Xie, L. Liao, T. Wu, D. Lin, Y. Liu, T.F. Jaramillo, J.K. Nørskov, and Y, Cui, "High-efficiency oxygen reduction to hydrogen peroxide catalysed by oxidized carbon materials," *Nature Catalysis,* 1, 156–162 (2018).

(142) A. Jackson, A. Strickler, D. Higgins, and T.F. Jaramillo, "Engineering Ru@Pt Core-Shell Catalysts for Enhanced Electrochemical Oxygen Reduction Mass Activity and Stability," *Nanomaterials,* 8, 38 (2018).

(141) S. Chen, Z. Chen, S. Siahrostami, T.R. Kim, D. Nordlund, D. Sokaras, S. Nowak, J.W.F. To, D. Higgins, R. Sinclair, J.K. Nørskov, T.F. Jaramillo, and Z. Bao, "Defective Carbon-Based Materials for the Electrochemical Synthesis of Hydrogen Peroxide," *ACS Sustainable Chem. Eng,* 6, 311–317 (2018).

2017

(140) P. Chakthranont, T.R. Hellstern, J.M. McEnaney, and T.F. Jaramillo, "Photocatalysis: Design and Fabrication of a Precious Metal-Free Tandem Core–Shell p+n Si/W-Doped BiVO4 Photoanode for Unassisted Water Splitting," *Advanced Energy Materials,* 7, 1614-6840 (2017).

(139) I. Narkeviciute and T.F. Jaramillo, "Impact of Nanostructuring on the Photoelectrochemical Performance of Si/Ta3N5 Nanowire Photoanodes," *J. Phys. Chem. C,* 121, 27295–27302 (2017).

(138) L.A. King, T.R. Hellstern, J. Park, R. Sinclair, and T. F. Jaramillo, "Highly Stable Molybdenum Disulfide Protected Silicon Photocathodes for Photoelectrochemical Water Splitting," *ACS Appl. Mater. Interfaces,* 9, 36792–36798 (2017).

(137) J.J. Willis, A. Gallo, D. Sokaras, H. Aljama, S.H. Nowak, E.D. Goodman, L. Wu, C.J. Tassone, T.F. Jaramillo, F. Abild-Pedersen, and M. Cargnello, "Systematic Structure–Property Relationship Studies in Palladium-Catalyzed Methane Complete Combustion," *ACS Catalysis,* 7, 7810–7821 (2017).

(136) E.L. Clark, C. Hahn, T.F. Jaramillo, and A.T. Bell, "Electrochemical CO2 Reduction over Compressively Strained CuAg Surface Alloys with Enhanced Multi-Carbon Oxygenate Selectivity," *JACS,* 139, 15848–15857 (2017).

(135) I. Narkeviciute, and T.F. Jaramillo, "Effects of Ta3N5 Morphology and Composition on the Performance of Si-Ta3N5 Photoanodes," *Solar RRL,* 1, 1700121 (2017).

(134) S. Xu, Y. Kim, D. Higgins, M. Yusuf, T. F. Jaramillo, and F.B. Prinz, "Building upon the Koutecky-Levich Equation for Evaluation of Next-Generation Oxygen Reduction Reaction," *Catalysts Electrochimica Acta*, 255, 99-108 (2017).

(133) X. Shi, S. Siahrostami, G.-L. Li, Y. Zhang, P. Chakthranont, F. Studt, T.F. Jaramillo, X. Zheng, and J.K. Nørskov, "Understanding activity trends in electrochemical water oxidation to form hydrogen peroxide," *Nature Communications*, 8, 701 (2017).

(132) A.L. Strickler, M. Escudero-Escribano, and T.F. Jaramillo, "Core–Shell Au@Metal-Oxide Nanoparticle Electrocatalysts for Enhanced Oxygen Evolution," *Nano Letters*, 17, 6040-6046 (2017).

(131) T.R. Hellstern, J. Kibsgaard, C. Tsai, D.W. Palm, L.A. King, F. Abild-Pedersen, and T.F. Jaramillo, "Investigating Catalyst–Support Interactions To Improve the Hydrogen Evolution Reaction Activity of Thiomolybdate $[Mo_3S_{13}]^{2-}$ Nanoclusters," *ACS Catalysis*, 7, 7126-7130 (2017).

(130) P. Chakthranont, T.R. Hellstern, J.M. McEnaney, and T.F. Jaramillo, "Design and Fabrication of a Precious Metal-Free Tandem Core–Shell p+n Si/W-Doped BiVO4 Photoanode for Unassisted Water Splitting," *Advanced Energy Materials*, 7, 1701515 (2017).

(129) Z.W. Ulissi, M.T. Tang, J. Xiao, X. Liu, D.A. Torelli, M. Karamad, K. Cummins, C. Hahn, N.S. Lewis, T.F. Jaramillo, K. Chan, and J.K. Norskov, "Machine-Learning Methods Enable Exhaustive Searches for Active Bimetallic Facets and Reveal Active Site Motifs for CO2 Reduction," *ACS Catalysis*, 7, 6600–6608 (2017).

(128) J. Resasco, L.D. Chen, E. Clark, C. Tsai, C. Hahn, T.F. Jaramillo, K. Chan, and A.T. Bell, "Promoter Effects of Alkali Metal Cations on the Electrochemical Reduction of Carbon Dioxide," *JACS*, 139, 11277–11287 (2017).

(127) L.V.P. Mendes, J.L. Snider, S.D. Fleischman, J. Kibsgaard, J.M. McEnaney, D.A.G. Aranda, and T.F. Jaramillo, "Polyol Synthesis of Cobalt–Copper Alloy Catalysts for Higher Alcohol Synthesis from Syngas," *Catalysis Letters*, 147, 2352–2359 (2017).

(126) P. Chakthranont, J. Kibsgaard, A. Gallo, J. Park, M. Mitani, D. Sokaras, T. Kroll, R. Sinclair, M.B. Mogensen, and T.F. Jaramillo, "Effects of Gold Substrates on the Intrinsic and Extrinsic Activity of High-Loading Nickel-Based Oxyhydroxide Oxygen Evolution Catalysts," *ACS Catalysis*, 7, 5399–5409 (2017).

(125) J.T. Feaster, A.L. Jongerius, X. Liu, M. Urushihara, S.A. Nitopi, C. Hahn, K. Chan, J.K. Nørskov, and T.F. Jaramillo, "Understanding the Influence of [EMIM]Cl on the Suppression of the Hydrogen Evolution Reaction on Transition Metal Electrodes," *Langmuir*, 33, 9464–9471 (2017).

(124) J. Kibsgaard, T.R. Hellstern, S.J. Choi, B.N. Reinecke, and T.F. Jaramillo, "Mesoporous ruthenium/ruthenium oxide thin films: Active electrocatalysts for the oxygen evolution reaction," *ChemElectroChem*, 4, 2480-2485 (2017).

(123) J.M. McEnaney, A.R. Singh, J.A. Schwalbe, J. Kibsgaard, J.C. Lin, M. Cargnello, T.F. Jaramillo, and J.K. Nørskov, "Ammonia synthesis from N2 and H2O using a lithium cycling electrification strategy at atmospheric pressure," *Energy Environ. Sci*, 10, 1621-1630 (2017).

(122) J.T. Feaster, C. Shi, E.R. Cave, T. Hatsukade, D.N. Abram, K.P. Kuhl, C.Hahn, J.K. Nørskov, and T.F. Jaramillo, "Understanding Selectivity for the Electrochemical Reduction of Carbon Dioxide to Formic Acid and Carbon Monoxide on Metal Electrodes," *ACS Catalysis*, 7, 4822-4827 (2017).

(121) E.R. Cave, J.H. Montoya, K.P. Kuhl, D.N. Abram, T. Hatsukade, C. Shi, C. Hahn, J.K. Nørskov, and T.F. Jaramillo, "Electrochemical CO_2 reduction on Au surfaces: mechanistic aspects regarding the formation of major and minor products," *Phys.Chem.Chem.Phys.*, 19, 15856-15863 (2017).

(120) M.H. Tang, P. Chakthranont, and T.F. Jaramillo, "Top-down fabrication of fluorine-doped tin oxide nanopillar substrates for solar water splitting," *RCS Adv.*, 7, 28350-28357 (2017).

(119) C. Hahn, T. Hatsukade, Y.-G. Kim, A. Vailionis, J.H. Baricuatro, D.C. Higgins, S.A. Nitopi, M.P. Soriaga, and T.F. Jaramillo, "Engineering Cu surfaces for the electrocatalytic conversion of CO_2: Controlling selectivity toward oxygenates and hydrocarbons," *PNAS*, 114, 5918–5923 (2017).

(118) E.D. Goodman, S. Dai, A.-C. Yang, C. Wrasman, A. Gallo, S.R. Bare, A.S. Hoffman, T.F. Jaramillo, G.W. Graham, X. Pan, and M. Cargnello, "Monodisperse Pt/Pd Bimetallic Nanocrystals Demonstrate Platinum Effect on Palladium Methane Combustion Activity and Stability," *ACS Catalysis*, 7, 4372–4380 (2017).

(117) J. Sanchez, M.V. Ramos-Garcés, I. Narkeviciute, J.L. Colón, and T.F. Jaramillo," Transition Metal-Modified Zirconium Phosphate Electrocatalysts for the Oxygen Evolution Reaction," *Catalysts*, 7, 132 (2017).

(116) Z. Chen, S. Chen, S. Siahrostami, P. Chakthranont, C. Hahn, D. Nordlund, S. Dimosthenis, J.K. Norskov, Z. Bao, and T.F. Jaramillo, "Development of a reactor with carbon catalysts for modular-scale, low-cost electrochemical generation of H_2O_2," *Reaction Chemistry & Engineering*, 2, 239-245 (2017).

(115) T. Hatsukade, K.P. Kuhl, E.R. Cave, D.N. Abram, J.T. Feaster, A.L. Jongerius, C. Hahn, and T.F. Jaramillo, "Carbon Dioxide Electroreduction using a Silver–Zinc Alloy," *Energy Technology*, 5, 955–961 (2017).

(114) R. Frydendal, L.C. Seitz, D. Sokaras, T.-C. Weng, D. Nordlund, I. Chorkendorff, I.E.L. Stephens, T.F. Jaramillo, "Operando investigation of Au-MnO_x thin films with improved activity for the oxygen evolution reaction," *Electrochimica Acta*, accepted and in press (2017).

(113) Z.W. Seh, J. Kibsgaard, C.F. Dickens, I. Chorkendorff, J.K. Nørskov, T.F. Jaramillo, "Combining theory and experiment in electrocatalysis: Insights into materials design," *Science*, 355, 6321, 2017.

(112) A.L. Strickler, A. Jackson, and T.F. Jaramillo, "Active and Stable Ir@Pt Core–Shell Catalysts for Electrochemical Oxygen Reduction," *ACS Energy Letters*, 2, 224-229, 2017.

(111) J.H. Montoya, L.C. Seitz, P. Chakthranont, A. Vojvodic, T.F. Jaramillo, and J.K. Norskov, "Materials for solar fuels and chemicals," *Nature Materials*, 16, 70-81, 2017.

2016

(110) A.R. Singh, B.A. Rohr, J.A. Schwalbe, M. Cargnello, K. Chan, T.F. Jaramillo, I. Chorkendorff, and J.K. Nørskov, "Electrochemical Ammonia Synthesis—The Selectivity Challenge *ACS Catalysis*, 7, 706–709, 2016.

(109) J.W.F. To, J.W.D. Ng, S. Siahrostami, A.L. Koh, Y. Lee, Z. Chen, K.D. Fong, S. Chen, J. He, W.-G. Bae, J. Wilcox, H.Y. Jeong, K. Kim, F. Studt, J.K. Nørskov, T.F. Jaramillo, and Z. Bao, "High-performance oxygen reduction and evolution carbon catalysis: From mechanistic studies to device integration," *Nano Research*, accepted and in press (2016).

(108) I. Narkeviciute, P. Chakthranont, A.J.M. Mackus, C. Hahn, B.A. Pinaud, S.F. Bent, T.F. Jaramillo, "Tandem Core-Shell Si–Ta_3N_5 Photoanodes for Photoelectrochemical Water Splitting," *Nano Letters*, 16, 7565–7572, 2016.

(107) J. Jia, L.C. Seitz, J.D. Benck, Y. Huo, Y. Chen, J.W.D. Ng, T. Bilir, J.S. Harris, and T.F. Jaramillo, "Solar water splitting by photovoltaic-electrolysis with a solar-to-hydrogen efficiency over 30%" *Nature Communications*, 7, 13237, 2016.

(106) L.C. Seitz, C.F. Dickens, K. Nishio, Y. Hikita, J. Montoya, A. Doyle, C. Kirk, A. Vojvodic, H.Y. Hwang, J.K. Norskov, T.F. Jaramillo, "A highly active and stable $IrO_x/SrIrO_3$ catalyst for the oxygen evolution reaction," *Science*, 353, 1011-1014, 2016.

(105) Z.W. Seh, K.D. Fredrickson, B. Anasori, J. Kibsgaard, A.L. Strickler, M.R. Lukatskaya, Y.Gogotsi, T.F. Jaramillo, and A. Vojvodic, "Two-Dimensional Molybdenum Carbide (MXene) as an Efficient Electrocatalyst for Hydrogen Evolution," *ACS Energy Lett*, vol 1, 589-598, 2016.

(104) P.A. Gross, T. Larsen, F. Loizeau, T.F. Jaramillo, D. Spitzer, and B. Pruitt, "Micro Fabricated Electrochemical Gas Sensor," *Micro & Nano Letters,* 2016.

(103) R.J. Britto, J.D. Benck, J.L. Young, C. Hahn, T.G. Deutsch, and T.F. Jaramillo, "Molybdenum Disulfide as a Protection Layer and Catalyst for Gallium Indium Phospide Solar Water Splitting Photocathodes," *J. Phys. Chem. Lett.,* vol. 7, pp. 2044-2049, 2016.

(102) J. Kibsgaard, A. Jackson, and T.F. Jaramillo, "Mesoporous platinum nickel thin films with double gyroid morphology for the oxygen reduction reaction," *Nano Energy,* 2016.

(101) J.W.D Ng, M. Garcia-Melchor, M. Badjich, P. Chakthranont, C. Kirk, A. Vojvodic, and T.F. Jaramillo, "Gold-supproted cerium-dopedd NiOx catalysts for water oxidation," *Nature Energy*, vol. 1, e16053, 2016.

(100) L.C. Seitz, D. Nordlund, A. Gallo, and T.F. Jaramillo, "Tuning Composition and Activity of Cobalt Titanium Oxide Catalysts for the Oxygen Evolution Reaction," *Electrochimica Acta,* 193, 240-245 2016.

(99) Y. Hikita, K. Nishio, L.C. Seitz, P. Chakthranont, T. Tachikawa, T.F. Jaramillo, and H.Y. Hwang, "Band edge engineering of oxide photoanodes for photoelectrochemical water splitting: Integration of subsurface dipoles with atomic-scale control," *Advanced Energy Materials*, 2015.

(98) P. Chakthranont, B.A. Pinaud, L.C. Seitz, A.J. Forman, and T.F. Jaramillo "Improving the Photoelectrochemical Performance of Hematite by Employing a High Surface Area Scaffold and Engineering Solid-Solid Interfaces," *Advanced Materials Interfaces,* 2015.

(97) B.N. Reinecke, K.P. Kuhl, H. Ogasawara, L. Li, J. Voss, F. Abild-Pedersen, A. Nilsson, T.F. Jaramillo "Elucidating the Electronic Structure of Supported Gold Nanoparticles and its Relevance to Catalysis by Means of Hard X-ray Photoelectron Spectroscopy," *Surface Science,* 650, 24-33 2015.

(96) S.C. Lee, J.D. Benck, C. Tsai, J. Park, A.L. Koh, F. Abild-Pedersen, T.F. Jaramillo, and R. Sinclair, "Chemical and Phase Evolution of Amorphous Molybdenum Sulfide Catalysts for Electrochemical Hydrogen Production," *ACS Nano*, 10, 624-632 2016.

2015

(95) L.C. Seitz, T.J.P. Hersbach, D. Nordlund, and T.F. Jaramillo "Enhancement Effect of Noble Metals on Manganese Oxide for the Oxygen Evolution Reaction," *Journal of Physical Chemistry Letters, vol.* 6, pp. 4178-4183, 2015.

(94) S.Jung, C.C.L. McCrory, I.M. Ferrer, J.C. Peters and T.F. Jaramillo, "Benchmarking nanoparticulate metal oxide electrocatalysts for the alkaline water oxidation reaction," *Journal of Materials Chemistry A*, vol. 4, pp. 3068-3076, 2016.

(93) M. Buonaiuto, A.G. De Chrisci, T.F. Jaramillo, and R.M. Waymouth, "Electrooxidation of Alcohols with Electrode-Supported Transfer Hydrogenation Catalysts," *ACS Catalysis, vol.* 5, pp. 7343-7349 2015.

(92) T.R. Hellstern, J.D. Benck, J. Kibsgaard, C. Hahn, and T.F. Jaramillo, "Engineering cobalt phosphide (CoP) thin film catalysts for enhanced hydrogen evolution activity on silicon photocathodes," *Advanced Energy Materials*, vol. 6, e1501758, 2015.

(91) J.W.D. Ng, T.R. Hellstern, J. Kibsgaard, A.C. Hinckley, J.D. Benck, and T.F. Jaramillo, "Polymer Electrolyte Membrane Electrolyzers Utilizing Non-precious Mo-based Hydrogen Evolution Catalysts," *ChemSusChem*, vol. 8, pp. 3512-3519, 2015.

(90) P. Chakthranont, L.C. Seitz, and T.F. Jaramillo, "Mapping Photoelectrochemical Current Distribution at Nanoscale Dimensions on Morphologically Controlled $BiVO_4$," *Journal of Physical Chemistry Letters*, vol. 6, pp. 3702-3707, 2015.

(89) C. Hahn, D.N. Abram, H.A. Hansen, T. Hatsukade, A. Jackson, N.C. Johnson, T.R. Hellstern, K. P. Kuhl, E.R. Cave, J. T. Feaster, and T. F. Jaramillo, "Synthesis of thin film AuPd alloys and their investigation for electrocatalytic CO_2 reduction," *Journal of Materials Chemistry*, 2015.

(88) J. Kibsgaard, C. Tsai, K. Chan, J.D. Benck, J.K. Nørskov, F. Abild-Pedersen, and T.F. Jaramillo,

"Designing an improved transition metal phosphide catalyst for hydrogen evolution using experimental and theoretical trends," *Energy and Environmental Science*, vol. 8, pg. 3022-3029, 2015.

(87) L.C. Seitz, B.A. Pinaud, D. Nordlund, Y. Gorlin, A. Gallo, T.F. Jaramillo, "$CoTiO_x$ Catalysts for the Oxygen Evolution Reaction," *Journal of the Electrochemical Society*, vol. 162, pp. H841-H846, 2015.

(86) D.N. Abrams, K.P. Kuhl, E.R. Cave, T.F. Jaramillo "Platinum and hybrid polyaniline–platinum surfaces for the electrocatalytic reduction of CO_2" *MRS Communications*, vol. 5, pp. 319-325 2015.

(85) K.L. Pickrahn, Y. Gorlin, L.C. Seitz, A. Garg, D. Nordlund, T.F. Jaramillo, S.F. Bent, "Applications of ALD MnO to electrochemical water splitting," *Physical Chemistry Chemical Physics*, vol. 17, pp. 14003-14011, 2015.

(84) S. Gul, J.W.D. Ng, R. Alonso-Mori, J. Kern, D. Sokaras, E. Anzenberg, B. Lassalle-Kaiser, Y. Gorlin, T.-C. Weng, P. Zewart, J.Z. Zhang, U. Bergmann, V.K. Yachandra, T.F. Jaramillo and J. Yano, "Simultaneous Detection of Electronic Structure Changes from Two Elements of a Bifunctional Catalyst Using Wavelength-Dispersive X-ray Emission Spectroscopy and *in situ* Electrochemistry," *Physical Chemistry Chemical Physics*, vol. 17, pp. 8901-8912, 2015.

(83) C.C.L. McCrory, S. Jung, I.M. Ferrer, S.M. Chatman, J.C. Peters, T.F. Jaramillo, "Benchmarking HER and OER Electrocatalysts for Solar Water Splitting Devices," *Journal of the American Chemical Society*, vol. 137, pp. 4347-4357, 2015.

2014

(82) H.G. Sanchez Casalongue, J.D. Benck, C. Tsai, R.K.B. Karlsson, S. Kaya, M.L. Ng, L.G.M. Pettersson, F. Abild-Pedersen, J. K. Nørskov, H. Ogasawara, T.F. Jaramillo and A. Nilsson, "Operando Characterization of an Amorphous Molybdenum Sulfide Nanoparticle Catalyst during the Hydrogen Evolution Reaction," *Journal of Physical Chemistry C*, vol. 118, pp. 29252-29259, 2014.

(81) J. Kibsgaard and T.F. Jaramillo, " Molybdenum Phosphosulfide: An Active, Acid-Stable Earth-Abundant Catalyst for the Hydrogen Evolution Reaction," *Angewandte Chemie*, vol. 53, pp. 14433-14437. 2014.

(80) J.M. Morbec, I. Narkeviciute, T.F. Jaramillo, and G. Galli, "Opto-electronic properties of Ta_3N_5: A joint theoretical and experimental study," *Physical Review B*, vol. 90, e155204, 2014.

(79) J.D. Benck, T.R. Hellstern, J. Kibsgaard, P. Chakthranont, T.F. Jaramillo, "Catalyzing the Hydrogen Evolution Reaction (HER) with Molybdenum Sulfide Nanomaterials," *ACS Catalysis*, vol. 136, pp. 3957-3971, 2014.

(78) K.P. Kuhl, T. Hatsukade, E.R. Cave, D.N. Abram, J. Kibsgaard, and T.F. Jaramillo, "Electrocatalytic conversion of carbon dioxide to methane and methanol on transition metal surfaces," *Journal of the American Chemical Society*, vol. 136, pp. 14107–14113, 2014.

(77) J.D. Benck, B.A. Pinaud, Y. Gorlin, and T.F. Jaramillo, "Substrate Selection for Fundamental Studies of Electrocatalysts and Photoelectrodes: Inert Potential Windows in Acidic, Neutral, and Basic Electrolyte," *PLoS ONE*, vol. 9, e107942, 2014.

(76) J.D. Benck, S.C. Lee, K.D. Fong, J. Kibsgaard, R. Sinclair, T.F. Jaramillo, "Designing active and stable silicon photocathodes for solar hydrogen production using molybdenum sulfide nanomaterials," *Advanced Energy Materials*, vol. 4, e1400739, pp. 18, 2014.

(75) M.H. Tang, C. Hahn, A.J. Klobuchar, J.W.D. Ng, J. Wellendorff, T. Bligaard, and T.F. Jaramillo, "Nickel-Silver Alloy Electrocatalysts for Hydrogen Evolution and Oxidation in Alkaline Electrolyte," *Physical Chemistry Chemical Physics*, vol. 16, pp. 19250-19257, 2014.

(74) T. Hatsukade, K.P. Kuhl, E.R. Cave, D.N. Abram, and T.F. Jaramillo, "Insights into the electrocatalytic reduction of CO_2 on metallic silver surfaces," *Physical Chemistry Chemical Physics*, vol. 16, pp. 13814-13819, 2014.

(73) J.W.D. Ng, Y. Gorlin, D. Nordlund, and T.F. Jaramillo, " Nanostructured manganese oxide supported onto particulate glassy carbon as an active and stable oxygen reduction catalyst in alkaline-based fuel cells," *Journal of the Electrochemical Society*, vol.161, pp. D3105-D3112, 2014.

(72) J.W.D. Ng, M.H. Tang, and T.F. Jaramillo, "A carbon-free, precious-metal-free, high-performance O_2 electrode for regenerative fuel cells and metal-air batteries," *Energy & Environmental Science*, vol. 7, pp. 2017-2024, 2014.

(71) L.C. Seitz, Z. Chen, A.J. Forman, B.A. Pinaud, J.D. Benck, and T.F. Jaramillo, "Modeling the Practical Performance Limits of Photoelectrochemical Water Splitting Based on the Current State of Materials Research," *ChemSusChem*, vol. 7, pp. 1372–1385, 2014.

(70) Y. Gorlin, C.-J. Chung, J.D. Benck, D. Nordlund, L.C. Seitz, T.-C. Weng, D. Sokaras, B.M. Clemens, T.F. Jaramillo, "Understanding interactions between manganese oxide and gold that lead to enhanced activity for electrocatalytic water oxidation," *Journal of the American Chemical Society*, vol. 136, pp. 4920-4926, 2014.

(69) K.X. Wang, Z. Yu, V. Liu, M.L. Brongersma, T.F. Jaramillo, and S. Fan, "Nearly Total Solar Absorption in Ultrathin Nanostructured Iron Oxide for Efficient Photoelectrochemical Water Splitting," *ACS Photonics*, vol. 1, pp. 235–240, 2014.

(68) B.A. Pinaud, A. Vailionis, T.F. Jaramillo, "Controlling the structural and optical properties of Ta_3N_5 films through nitridation temperature and the nature of the Ta metal," *Chemistry of Materials*, vol. 26, pp. 1576-1582, 2014.

(67) A.J. Forman, Z. Chen, P. Chakthranont, T.F. Jaramillo, "High Surface Area Transparent Conducting Oxide Electrodes with a Customizable Device Architecture," *Chemistry of Materials*, vol. 26, pp. 958-964, 2014.

(66) J. Kibsgaard, T.F. Jaramillo, F. Besenbacher, "Building an appropriate active site motif into a hydrogen evolution catalyst with thiomolybdate $[Mo_3S_{13}]^{2-}$ clusters," *Nature Chemistry*, vol. 6, pp. 248-253, 2014.

(65) A. Jackson, V. Viswanathan, A.J. Forman, A.H. Larsen, J.K. Nørskov, T.F. Jaramillo "Climbing the activity volcano: Core-shell Ru@Pt electrocatalysts for oxygen reduction" *ChemElectroChem*, vol. 1, pp. 67-72, 2014.

2013

(64) A. Saha, D.N. Abram, K.P. Kuhl, J. Paradis, J.L. Crawford, E. Sasmaz, R. Chang, T.F. Jaramillo, J. Wilcox, "An XPS study of surface changes on brominated and sulfur-treated activated carbon sorbents during mercury capture: Performance of pellet versus fiber sorbents," *Environmental Science & Technology*, vol. 47, pp 13695–13701, 2013.

(63) C.C.L. McCrory, S. Jung, J.C. Peters, T.F. Jaramillo, "Benchmarking Heterogeneous Electrocatalysts for the Oxygen Evolution Reaction" *Journal of the American Chemical Society*, vol. 135, pp. 16977–16987, 2013.

(62) J.W.D. Ng, Y. Gorlin, T. Hatsukade, T.F. Jaramillo, "A precious-metal free regenerative fuel cell for storing renewable electricity," *Advanced Energy Materials*, vol. 3, pp. 1545–1550, 2013.

(61) B.A. Pinaud, J.D. Benck, L.C. Seitz, A.J. Forman, Z. Chen, T.G. Deutsch, B.D. James, K.N. Baum, G.N. Baum, S. Ardo, H. Wang, E. Miller, T.F. Jaramillo, "Technical and economic feasibility of centralized facilities for solar hydrogen production via photocatalysis and photoelectrochemistry" *Energy & Environmental Science*, vol. 6, pp. 1983-2002, 2013.

(60) Y. Gorlin, B. Lassalle-Kaiser, J.D. Benck, S. Gul, S.M. Webb, V. Yachandra, J. Yano, T.F. Jaramillo, "*In-situ* X-Ray Absorption Spectroscopy (XAS) Investigation of a Bi-functional Manganese Oxide Catalyst with High Activity for Electro-chemical Water Oxidation and Oxygen Reduction" *Journal of the American Chemical Society*, vol. 135, pp. 8525–8534, 2013.

(59) M.E. Suss, T.F. Baumann, M.A. Worsley, J. Biener, K.A. Rose, T.F. Jaramillo, M. Stadermann, J.G. Santiago "Impedance-based study of capacitive porous carbon electrodes with hierarchical and bimodal porosity" *Journal of Power Sources*, vol. 241, pp. 266-273, 2013.

(58) Z. Chen, A.J. Forman, T.F. Jaramillo, "Bridging the Gap Between Bulk and Nanostructured Photoelectrodes: The Impact of Surface States on the Electrocatalytic and Photoelectrochemical Properties of MoS_2" *Journal of Physical Chemistry C*, vol. 117, pp. 9713-9722, 2013.

(57) H.B.R. Lee, S.H. Baeck, T.F. Jaramillo, S.F. Bent, "Growth of Pt Nanowires by Atomic Layer Deposition on Highly Ordered Pyrolytic Graphite" *Nano Letters*, vol. 13, pp. 457-463, 2013.

(56) A. Jackson, V. Viswanathan, A.J. Forman, J.K. Nørskov, T.F. Jaramillo, "Effects of a New Electrochemical Cleaning Protocol on Ru@Pt Core-Shell ORR Catalysts," *ECS Transactions*, Vol. 58, pp. 929-936, 2013.

(55) Y. Gorlin, D. Nordlund, T.F. Jaramillo, "The Role of Heat Treatment in Enhanced Activity of Manganese Oxides for the Oxygen Reduction and Evolution Reactions," *ECS Transactions*, Vol. 58, pp. 735-750, 2013.

(54) L.C. Seitz, B.A. Pinaud, D. Nordlund, T.F. Jaramillo, "Effect of Temperature Treatment on $CoTiO_x$ Catalyst for the Oxygen Evolution Reaction," *ECS Transactions*, Vol. 58, pp. 285-291, 2013.

2012

(53) Y. Gorlin, C.-J. Chung, D. Nordlund, B.M. Clemens, T.F. Jaramillo, "Mn_3O_4 supported on glassy carbon: An active non-precious metal catalyst for the oxygen reduction reaction" *ACS Catalysis*, vol. 2, pp. 2687-2694, 2012.

(52) J. Kibsgaard, Z. Chen, B.N. Reinecke, T.F. Jaramillo, "Engineering the surface structure of MoS_2 to preferentially expose active edge sites for electrocatalysis" *Nature Materials*, vol. 11, pp. 963-969, 2012.

(51) I.E. Castelli, D.D. Landis, K.S. Thygesen, S. Dahl, I. Chorkendorff, T.F. Jaramillo, K.W. Jacobsen, "New cubic perovskites for one- and two-photon water splitting using the Computational Materials Repository" *Energy & Environmental Science*, vol. 5, pp. 9034-9043, 2012.

(50) H.-Y. Su, Y. Gorlin, I.C. Man, F. Calle-Vallejo, J.K. Nørskov, T.F. Jaramillo, J. Rossmeisl, "Identifying active surface phases for metal oxide electrocatalysts: A study of manganese oxide bi-functional catalysts for oxygen reduction and water oxidation catalysis," *Physical Chemistry Chemical Physics*, vol. 14, pp. 14010-14022, 2012.

(49) K.L. Pickrahn, S.W. Park, Y. Gorlin, H.B.R. Lee, T.F. Jaramillo, S.F. Bent, "Active MnOx Electrocatalysts Prepared by Atomic Layer Deposition for the Oxygen Evolution and Oxygen Reduction Reactions," *Advanced Energy Materials*, vol. 2, pp. 1269-1277, 2012.

(48) J.D. Benck, Z. Chen, L.Y. Kuritzky, A.J. Forman, T.F. Jaramillo, "Amorphous Molybdenum Sulfide Catalysts for Electrochemical Hydrogen Production: Insights into the Origin of their Catalytic Activity," *ACS Catalysis*, vol. 2, pp. 1916-1923, 2012.

(47) Y. Gorlin and T.F. Jaramillo, "Investigation of surface oxidation processes on manganese oxide electrocatalysts using electrochemical methods and ex-situ X-ray photoelectron spectroscopy," *Journal of the Electrochemical Society*, vol. 159, no. 10, pp. H782-H786, 2012.

(46) B.A. Pinaud, P.C.K. Vesborg, T.F. Jaramillo, "Effect of film morphology and thickness on charge transport in Ta_3N_5/Ta photoanodes for solar water splitting" *Journal of Physical Chemistry C*, vol. 116, no. 30, pp. 15918-15924, 2012.

(45) P.C.K. Vesborg and T.F. Jaramillo, "Addressing the TW Challenge: Scalability in the supply of chemical elements for renewable energy," *RSC Advances*, vol. 2, pp. 7933-7947, 2012.

(44) E. Sasmaz, A. Kirchofer, A.D. Jew, A. Saha, D.N. Abram, T.F. Jaramillo, J. Wilcox, "Mercury Chemistry on Brominated Activated Carbon," *Fuel*, Vol. 99, pp. 188-196, 2012.

(43) J. Kibsgaard, Y. Gorlin, Z. Chen, T.F. Jaramillo "Meso-structured Pt thin films: Active and Stable Electrocatalysts for the Oxygen Reduction Reaction," *Journal of the American Chemical Society*, Vol. 134, No. 18, pp. 7758-7765, 2012.

(42) K.P. Kuhl, E.R. Cave, D.N. Abram, T.F. Jaramillo, "New insights into the electrochemical reduction of carbon dioxide on metallic copper surfaces," *Energy & Environmental Science*, Vol. 5, pp. 7050-7059, 2012.

(41) V. Viswanathan, H.A. Hansen, J. Rossmeisl, T.F. Jaramillo, H. Pitsch, J.K. Nørskov, "Simulating Linear Sweep Voltammetry from First Principles: Application to Electrochemical Oxidation of Water on Pt(111) and $Pt_3Ni(111)$," *Journal of Physical Chemistry C*, Vol. 116, No. 7, pp. 4698-4704, 2012.

2011

(40) I.S. Cho, Z. Chen, A.J. Forman, D.R. Kip, P.M. Rao, T.F. Jaramillo, X. Zheng, "Branched TiO_2 Nanorods for Photoelectrochemical Hydrogen Production," *Nano Letters*, Vol. 11, No. 11, pp. 4978-4984, 2011.

(39) Y. Gorlin, T.F. Jaramillo, "*Ex-situ* Spectroscopy Study of Manganese Oxide Catalytic Surfaces under Reaction Conditions Relevant to Oxygen Reduction and Oxygen Evolution," *ECS Transactions*, Vol. 41, No. 1, pp. 1701-1707, 2011.

(38) Z. Chen, D. Cummins, B.N. Reinecke, E. Clark, M. Sunkara, T.F. Jaramillo, "Core-shell MoO_3-MoS_2 Nanowires for Hydrogen Evolution: A Functional Design for Electrocatalytic Materials," *Nano Letters*, Vol. 11, pp. 4168-4175, 2011.

(37) I. Thomann, B.A. Pinaud, Z. Chen, B.M. Clemens, T.F. Jaramillo, M.L. Brongersma, "Plasmon Enhanced Solar-to-Fuel Energy Conversion," *Nano Letters*, Vol. 11, No. 8, pp. 3440-3446, 2011.

(36) B.A. Pinaud, Z. Chen, D.N. Abram, T.F. Jaramillo, "Thin films of Na birnessite-type MnO_2: Optical properties, electronic band structure, and solar photo-electrochemistry," *Journal of Physical Chemistry C*, Vol. 115, No. 23, pp. 11830-11838, 2011.

(35) I.C. Man, H.-Y. Su, F. Calle-Vallejo, H.A. Hansen, J.I. Martínez , N.G. Inoglu, J. Kitchin, T. F. Jaramillo, J.K. Nørskov, J. Rossmeisl, "Universality in Oxygen Evolution Electro-Catalysis on Oxide Surfaces," *ChemCatChem*, Vol. 3, No. 7, pp. 1159-1165, 2011.

2010

(34) Z. Chen, J. Kibsgaard, and T. F. Jaramillo, "Nanostructuring MoS_2 for Photoelectrochemical Water Splitting," *Proceedings of SPIE – The International Society for Optical Engineering*, Vol. 7770, pp. 77700K-6, 2010.

(33) Y. Gorlin, T.F. Jaramillo, "A bifunctional nonprecious metal catalyst for oxygen reduction and water oxidation," *Journal of the American Chemical Society*, Vol. 132, No. 39, pp. 13612-13614, 2010.

(32) Z. Chen, T. F. Jaramillo, T. G. Deutsch, A. Kleiman-Shwarsctein, A. J. Forman, N. Gaillard, R. Garland, K. Takanabe, C. Heske, M. Sunkara, E. W. McFarland, K. Domen, E. L. Miller, J. A. Turner, H. N. Dinh, "Accelerating materials development for photoelectrochemical (PEC) hydrogen production: Standards for methods, definitions, and reporting protocols," *Journal of Materials Research*, Vol. 25, No. 1, pp. 3-16, 2010.

2009

(31) J. Greeley, I.E.L. Stephens, A.S. Bondarenko, T. P. Johansson, H. A. Hansen, T. F. Jaramillo, J. Rossmeisl, I. Chorkendorff, J. K. Nørskov, "Alloys of platinum and early

transition metals as oxygen reduction electrocatalysts," *Nature Chemistry*, Vol. 1, No. 7, pp. 552-556, 2009.

(30) J. H. Nielsen, K. P. Jørgensen, J. Bonde, K. Nielsen, L. Bech, Y. Tison, S. Horch, T. F. Jaramillo, I. Chorkendorff, "Combined spectroscopy and microscopy of supported MoS_2 nanoparticles," *Surface Science*, Vol. 603, No. 9, pp. 1182-1189, 2009.

(29) W. Tang, S. Jayaraman, T.F. Jaramillo, G.D. Stucky, E.W. McFarland, "Electrocatalytic activity of gold-platinum clusters for low temperature fuel cell applications," *Journal of Physical Chemistry C*, Vol. 113, No. 12, pp. 5014-5024, 2009.

(28) B. L. Abrams, P. C. K. Vesborg, J. Bonde, T. F. Jaramillo, I. Chorkendorff, "The Dynamics of Surface Exchange Reactions Between Au and Pt for the Hydrogen Evolution Reaction (HER) and the Hydrogen Oxidation Reaction (HOR)," *Journal of the Electrochemical Society*, Vol. 156, No. 2, pp. B273-B282, 2009.

2008

(27) J. Rossmeisl, G. S. Karlberg, T. F. Jaramillo, J. K Nørskov, **"**Steady state oxygen reduction reaction and cyclic voltammetry," *Faraday Discussions*, Vol. 140, pp. 337-346, 2008.

(26) J. Bonde, P.G. Moses, T.F. Jaramillo, J.K. Nørskov, I. Chorkendorff, "Hydrogen Evolution on Nanoparticulate Transition Metal Sulfides," *Faraday Discussions*, Vol. 140, pp. 219-231, 2008.

(25) T.F. Jaramillo, J. Bonde, J. Zhang, B.L. Ooi, K. Andersson, J. Ulstrup, I. Chorkendorff, "Hydrogen evolution on incomplete cubane-type supported $[Mo_3S_4]^{4+}$ electrocatalysts," *Journal of Physical Chemistry C*, Vol. 112, No. 45, pp. 17492-17498, 2008.

2007

(24) G. S. Karlberg, T.F. Jaramillo, E. Skúlason, J. Rossmeisl, T. Bligaard, J.K. Nørskov, "Cyclic voltammograms for H on Pt(111) and Pt(100) from first principles," *Physical Review Letters*, Vol. 99, Article No. 126101, 2007.

(23) T.F. Jaramillo, K. P. Jørgensen, J. Bonde, J. H. Nielsen, S. Horch, I. Chorkendorff, "Identification of Active Edge Sites for Electrochemical H_2 Evolution from MoS_2 Nanocatalysts," *Science*, Vol. 317, No. 5834, pp. 100-102, 2007.

(22) G.S. Karlberg, T.F. Jaramillo, E. Skulasson, J. Rossmeisl, T. Bligaard, "Cyclic Voltammograms from First Principles," *ECS Transactions*, Vol. 11, pp. 759-768, 2007.

2006

(21) J. Greeley, T.F. Jaramillo, J. Bonde, I. Chorkendorff, J.K. Nørskov, "Computational high-throughput screening of electrocatalytic materials for hydrogen evolution," *Nature Materials*, Vol. 5, No. 11, pp. 909-913, 2006.

(20) A. Kleiman-Shwarsctein, T.F. Jaramillo, S.-H. Baeck, M. Sushchikh, E.W. McFarland, "Low-voltage electrodeposition of fullerol thin films from aqueous solutions," *Journal of the Electrochemical Society*, Vol. 153, No. 7, pp. C483-C487, 2006.

2005

(19) S. Jayaraman, T.F. Jaramillo, S.-H. Baeck, E.W. McFarland, "Synthesis and characterization of Pt-WO_3 films as methanol oxidation catalysts for low-temperature polymer electrolyte membrane fuel cells," *Journal of Physical Chemistry B*, Vol. 109, No. 48, pp. 22958-22966, 2005.

(18) S. Jayaraman, S.-H. Baeck, T.F. Jaramillo, A. Kleiman-Shwarsctein, E.W. McFarland, "Combinatorial electrochemical synthesis and screening of Pt-WO_3 catalysts for electro-oxidation of methanol," *Review of Scientific Instruments*, Vol. 76, No. 6, Art. No. 062227, 2005.

(17) X. Liu, T.F. Jaramillo, A. Kolmokov, S.-H. Baeck, M. Moskovits, G. Stucky, E.W. McFarland, "Synthesis of titania nanotubes with supported Au nanoclusters," *Journal of Materials Research*, Vol. 20, No. 5, pp. 1093-1096, 2005.

(16) T.F. Jaramillo, S.-H. Baeck, A. Kleiman-Shwarsctein, K.-S. Choi, G.D. Stucky, E.W. McFarland, "Automated electrochemical synthesis and photoelectrochemical characterization of $Zn_{1-x}Co_xO$ thin films for solar hydrogen production," *Journal of Combinatorial Chemistry*, Vol. 7, No. 2, pp. 264-271, 2005.

(15) S.-H. Baeck, T.F. Jaramillo, A. Kleiman-Shwarsctein, and E.W. McFarland, "Automated electrochemical synthesis and characterization of TiO_2 supported Au nanoparticle electrocatalysts," *Measurement Science & Technology*, Vol. 16, No. 1, pp. 54-59, 2005.

2004

(14) J.M. Mwabora, T. Lindgren, E. Avendaño, T.F. Jaramillo, J. Lu, S.-E. Lindquist, C.-G. Grandqvist, "Structure, composition, and morphology of photoelectrochemically active $TiO_{2-x}N_x$ thin films deposited by reactive DC magnetron sputtering," *Journal of Physical Chemistry B*, Vol. 108, No. 52, pp. 20193-20198, 2004.

(13) J. Chou, N.R. Franklin, S.-H. Baeck, T.F. Jaramillo, E.W. McFarland, "Gas-phase catalysis by micelle derived Au nanoparticles on oxide supports," *Catalysis Letters*, Vol. 95, No. 3-4, pp. 107-111, 2004.

(12) S.-H. Baeck, T.F. Jaramillo, D.H. Jeong, E.W. McFarland, "Parallel synthesis and characterization of photoelectrochemically and electrochromically active tungsten molybdenum oxides," *Chemical Communications*, Vol. 4, pp. 390-391, 2004.

(11) T.F. Jaramillo, S.-H. Baeck, A. Kleiman-Shwarsctein, and E.W. McFarland, "Combinatorial electrochemical synthesis and screening of mesoporous ZnO for photocatalysis," *Macromolecular Rapid Communications*, Vol. 25, No. 1, pp. 297-301, 2004.

2003

(10) S.-H. Baeck, K.-S. Choi, T.F. Jaramillo, G.D. Stucky, and E.W. McFarland, "Enhancement of photocatalytic and electrochromic properties of electrochemically fabricated mesoporous WO_3 thin films," *Advanced Materials*, Vol. 15, No. 15, pp. 1269-1273, 2003.

(9) S.-H. Baeck, T.F. Jaramillo, G.D. Stucky, and E.W. McFarland, "Synthesis of tungsten oxide on copper surfaces by electroless deposition," *Chemistry of Materials*, Vol. 15, No. 18, pp. 3411-3413, 2003.

(8) B. Roldan-Cuenya, S.-H. Baeck, T.F. Jaramillo, E.W. McFarland, "Size and support dependent electronic and catalytic properties of Au^0/Au^{3+} nanoparticles synthesized from block co-polymer micelles," *Journal of the American Chemical Society*, Vol. 125, No. 42, pp. 12928-12934, 2003.

(7) T.F. Jaramillo, S.-H. Baeck, B. Roldan-Cuenya, E.W. McFarland, "Catalytic activity of supported Au nanoparticles deposited from block copolymer micelles," *Journal of the American Chemical Society*, Vol. 125, No. 24, pp. 7148-7149, 2003.

(6) W. Siripala, A. Ivanovskaya, T.F. Jaramillo, S.-H. Baeck, E.W. McFarland, "A Cu_2O/TiO_2 heterojunction thin film cathode for photoelectrocatalysis," *Solar Energy Materials and Solar Cells*, Vol. 77, No. 3, pp. 229-237, 2003.

2002

(5) S.-H. Baeck, T.F. Jaramillo, E.W. McFarland, "Influence of composition and morphology on photo and electrocatalytic activity of electrodeposited Pt/WO_3," *Proceedings of the American Chemical Society, Fuel Division*, 224th National Meeting, Boston, MA, 2002.

(4) S.-H. Baeck, T.F. Jaramillo, G.D. Stucky, E. McFarland, "Controlled electrodeposition of nanoparticulate tungsten oxide," *Nano Letters*, Vol. 2, No. 8, pp. 831-834, 2002.

(3) S.-H. Baeck, T.F. Jaramillo, C. Brändli, E. McFarland, "Combinatorial electrochemical synthesis and characterization of tungsten-based mixed metal oxides," *Journal of Combinatorial Chemistry*, Vol. 4, No. 6, pp. 563-568, 2002.

(2) T.F. Jaramillo, A. Ivanovskaya, E.W. McFarland, "High-throughput screening system for catalytic hydrogen-producing materials," *Journal of Combinatorial Chemistry*, Vol. 4, No. 1, pp. 17-22, 2002.

2001

(1) C. Brandli, T.F. Jaramillo, A. Ivanovskaya, E.W. McFarland, "Automated synthesis and characterization of diverse libraries of macroporous alumina," *Electrochimica Acta*, Vol. 47, No. 4, pp. 553-557, 2001.

Research Talks

2025

(invited) 2025 NSF-PREM CIE2M / DOE-RENEW PIRES-PR Joint Symposium Renewable Energy Research Under the Caribbean Sun, University of Puerto Rico – Río Piedras (UPR-RP), "Understanding interfaces for the sustainable, electrochemical production of hydrogen and for the conversion of CO_2 to carbon-based fuels and chemicals," T.F. Jaramillo, January 2025.

2024

(invited) Hyundai Motor Company Webinar (virtual), "Electrochemical CO_2 Reduction: Challenges and Opportunities in Going from Fundamental Studies to Applied Platforms," T.F. Jaramillo, December 2024.

(invited, poster) 2024 U.S. Department of Energy, Catalysis Science Program PI Meeting, Rockville, MD, "Insights into the dynamics of electrocatalysts for energy conversion reactions: In-situ and operando techniques to understand activity, selectivity, and durability," T.F. Jaramillo, G.A. Kamat, M.E. Kreider, J. Schröder, R.B. Dukuly Jr, J.T. Perryman, B. Joensen, J.E. Matthews, A.M. Aleman, M.B. Stevens, November 2024.

(keynote) PRiME 2024 Joint International Meeting Pacific Rim Meeting on Electrochemical and Solid-State Science, Honolulu, HI, "Understanding Interfaces in Electrochemical CO2 Reduction: From Model Systems to Applied Platforms," T.F. Jaramillo, October 2024.

(invited) Dept. of Chemical and Biological Engineering, The University of British Columbia, Vancouver, Canada, "Design principles for catalysts, transport processes, and the reaction microenvironment for improved electrolyzers and related technologies," T.F. Jaramillo, September 2024.

(invited) 2024 Fall Meeting of the American Chemical Society (ACS), Denver, CO, "Understanding interfaces for the sustainable conversion of CO_2 to carbon-based fuels and chemicals," T.F. Jaramillo, August 2024.

(invited) SURFcat Summer School, Kobæk Strand, DK, "A tutorial on techno-economics," T.F. Jaramillo, August 2024.

(invited) Centre for Hydrogen Innovations, Grand Opening, Singapore, "How R&D can accelerate the transition to sustainable processes for fuels and chemicals," T.F. Jaramillo, July 2024.

(keynote) 18th international Congress on Catalysis (ICC) Lyon, France, "Transition metal sulfides and related catalysts for electrochemical and photoelectrochemical (PEC) H_2 production and use," T.F. Jaramillo, July 2024.

(invited) 245th Meeting of The Electrochemical Society (ECS), San Francisco, CA, "Developing Methods to Interrogate Nanomaterials in Action for Electrochemical Energy Conversion Reactions," T.F. Jaramillo, May 2024.

(invited) 245th Meeting of The Electrochemical Society (ECS), San Francisco, CA, "Solar Fuels Systems: Interfacing Catalysts and Semiconductors for H_2 Production, CO_2 Reduction, and Related Chemistries," T.F. Jaramillo, May 2024.

(invited) Stanford Medicine Center for Improvement (SMCI) Lecture Series Webinar (virtual), "Striving for global sustainability: Where are we and where do we go from here?" T.F. Jaramillo, April 2024.

(invited) MATSUS24: Materials for Sustainable Development Conference #MatInter - Materials and Interfaces for emerging electrocatalytic reactions, Barcelona, Spain, "Understanding reactive interfaces for electrochemical transformations: H_2 evolution, CO_2 reduction and N_2 conversion," T.F. Jaramillo, March 2024.

(invited) Reliability Science for Photovoltaic and Electrochemical Energy Conversion: Research Needs and Synergies, Virtual Meeting, "Challenges at Scale: Electrolyzers", T.F. Jaramillo, March 2024.

(invited) National University of Singapore (NUS) Centre for Hydrogen Innovations (CHI) Webinar, "A tutorial on techno-economics," T.F. Jaramillo, March 2024.

(invited) Stanford Volunteer Leadership Summit 2024, Stanford University, Stanford, CA, "Innovating Sustainable Processes for Energy, Fuels and Chemicals," T.F. Jaramillo, February 2024.

(invited) Department of Chemical Engineering Seminar Series, University of Texas, Austin, TX, "Catalyzing solutions for the sustainable production and use of fuels and chemicals," T.F. Jaramillo, January 2024.

(invited) Stanford Engineering Research Introductions (SERIS), Stanford University, "Designing catalysts and chemical processes for global sustainability," T.F. Jaramillo, January 2025.

2023

Annual Meeting of the American Institute of Chemical Engineers (AIChE), Orlando, FL, "In-situ and operando methods to understand electrified processes for the production of fuels and chemicals," T.F. Jaramillo, November 2023.

(invited) Korea University, Virtual Seminar, "Fundamentals of the Electrocatalytic Reduction of CO2 for the Sustainable Production of Fuels and Chemicals," T.F. Jaramillo, November 2023.

(invited) Department of Chemical and Biomolecular Engineering (CBE) Seminar Series, University of California, Irvine, CA, "Catalyzing solutions for the sustainable production and use of fuels and chemicals," T.F. Jaramillo, October 2023.

(invited) 244rd Electrochemical Society Meeting, Gothenburg, Sweden, "Developing Catalysts and Interfaces for Hydrogen Production By Water Electrolysis and Solar Photoelectrochemistry," T.F. Jaramillo, October 2023.

(invited) Big Ideas Series Fireside Chat with Bill Gates, moderated by Thomas F. Jaramillo, Stanford Doerr School for Sustainability, Stanford University, CA, October 2023.
https://sustainability.stanford.edu/news/bill-gates-lecture-launches-new-big-ideas-series

(plenary) XV Aniversario del CCIQS UAEMéx-UNAM, Centro Conjunto de Investigación de Química Sustentable, Universidad Autónoma del Estado de México, Universidad Nacional Autónoma de México, Toluca, México, "Catalyzing solutions for the sustainable production and use of fuels and chemicals," T.F. Jaramillo, September 2023 (talk given in Spanish).

(invited) Centro de Investigación y de Estudios Avanzados del Instituto Politécnico Nacional (CINVESTAV), México City, MX, "Catalyzing solutions for the sustainable production and use of fuels and chemicals," T.F. Jaramillo, September 2023 (talk given in Spanish).

(invited) Sila Nanotechnologies, Alameda, CA, "Design and development of catalyst materials for sustainable energy conversion," T.F. Jaramillo, September 2023.

(invited, poster) U.S. DOE BES Catalysis Science Program PI Meeting, "Designing, Developing, and Understanding Electrocatalysts and Interfaces for Energy Conversion Reactions," T.F. Jaramillo, September 2023.

(invited) 2023 SUNCAT Summer Institute, Stanford University, CA, "2023 SUNCAT Summer Institute: Welcome Address", A. Hoffman, F. Abild-Pedersen, and T.F. Jaramillo, August 2023.
(invited) Department of Chemical & Biomolecular Engineering, National University of Singapore (NUS), Singapore, "Design principles for catalysts, transport processes, and the reaction microenvironment for improved electrolyzers and related technologies," T.F. Jaramillo, July 2023.

(invited) Temasek, Singapore, "Techno-economics and Techno-energetics for CO2-to-X Technologies," T.F. Jaramillo, July 2023.

(plenary) 28th North American Catalysis Society Meeting, Providence, RI, "Insights into the Electrified Interface in CO2 Reduction Catalysis Using Operando ATR-SEIRAS," J.E. Aviles Acosta, J.E. Matthews, J.C. Lin, D.U. Lee, C. Hahn, A.C. Nielander, T.F. Jaramillo, June 2023.

(invited) Greenhouse Gas Removal (GHG-R) Workshop, Stanford Doerr School of Sustainability, Stanford University, CA, (moderator and presenter) "Engineered Solutions Panel," T.F. Jaramillo, June 2023.

(invited) SK Innovation CCU Experts Seminar & Network Session, San Francisco, CA, "Progress and Perspectives of Co-Electrolysis," T.F. Jaramillo, June 2023.

(invited) Electrochemical Society (ECS) Webinar Series, "Electrocatalysis for the sustainable production of fuels and chemicals," T.F. Jaramillo, June 2023.

(invited) 243rd Electrochemical Society (ECS) Meeting, Boston, MA, "Catalysts and Interfaces for Low-Temperature Water Electrolysis," T.F. Jaramillo, May 2023.

(invited) Stanford Energy Solutions Week 2023, Precourt Institute for Energy, Stanford University, CA, (panel moderator/presenter), "New Energy Carriers and Fuels," T.F. Jaramillo, May 2023.

(invited) TiECon 2023, Santa Clara Convention Center, Santa Clara, CA, "Breakthrough physical chemistry technologies to get to a Low Carbon Economy," T.F. Jaramillo, May 2023.

(invited) U.S. DOE Annual Review of the Fuels From Sunlight Hub, Liquid Solar Fuel Alliance (LiSA), "LiSA: Alliance, Diversity, Equity, Inclusion," T.F. Jaramillo, May 2023.

(invited) U.S. DOE Annual Review of the Fuels From Sunlight Hub, Liquid Solar Fuel Alliance (LiSA), "Photo-electrochemical CO2 reduction," P. Agbo and T.F. Jaramillo, May 2023.

(invited) 243rd Electrochemical Society (ECS) Meeting, Boston, MA, "Photoelectrochemical CO2 Reduction (CO2R) with Si- and III-V Based Systems," T.F. Jaramillo, May 2023.

(invited) University of Puerto Rico, Humacao, PR, "Building bridges between SLAC/Stanford and colleges and universities in Puerto Rico," T.F. Jaramillo, April 2023. (talk given in Spanish)

(invited) University of Puerto Rico, Mayagüez, PR, "Building bridges between SLAC/Stanford and colleges and universities in Puerto Rico," T.F. Jaramillo, April 2023. (talk given in Spanish)

(invited) University of Puerto Rico, Bayamón, PR, "Building bridges between SLAC/Stanford and colleges and universities in Puerto Rico," T.F. Jaramillo, April 2023. (talk given in Spanish)

(invited) Stanford Distinguished Careers Institute (DCI) Community Celebration 2023, Stanford University, CA, "Developing Sustainable Processes for Energy, Fuels, Chemicals," T.F. Jaramillo, April 2023.

(invited) 2023 Spring Meeting of the American Chemical Society, Indianapolis, IN, "Understanding interfacial phenomena in catalyzing CO2 electro-reduction to fuels and chemicals," T.F. Jaramillo, March 2023.

(invited) Grad Alumni Day 2023 Microlectures, Stanford University, "Engineering New, Sustainable Processes for Chemicals, Fuels, and Energy," T.F. Jaramillo, March 2023.

(invited) 2023 Spring Meeting of the American Chemical Society, Indianapolis, IN, "Designing catalysts and interfaces for solar-driven H2 production and CO2 reduction," T.F. Jaramillo, March 2023.

(invited) Stanford Doerr School for Sustainability Faculty Forum, Stanford University, "Re-imagining fuels and chemicals for a sustainable future," T.F. Jaramillo, February 2023.

(invited) Designing catalysts and chemical processes for global sustainability workshop, Woodside, CA. "Designing catalysts and chemical processes for global sustainability," T.F. Jaramillo, January 2023.

(invited) Stanford Engineering Research Introductions (SERIS), Stanford University, "Designing catalysts and chemical processes for global sustainability," T.F. Jaramillo, January 2023.

(invited) Department of Chemical & Biomolecular Engineering, National University of Singapore (NUS), Singapore, "Developing catalysts, devices, and processes for sustainable H2 production and CO2 conversion," T.F. Jaramillo, January 2023.

2022

(invited) LiSA All Hands Meeting 2022, Asilomar, CA "DEI in LiSA" T.F. Jaramillo, December 2022.

(invited) Stanford Board of Oversight, SLAC Scientific Programs Committee (SPC), SLAC National Accelerator Laboratory, Menlo Park, CA. "SUNCAT Center for Interface Science & Catalysis," T.F. Jaramillo, November 2022.

2022 American Institute of Chemical Engineers (AIChE) Annual Meeting, Phoenix, AZ "Electrochemical CO2 Reduction: From Fundamentals to More Applied Systems," T.F. Jaramillo, November 2022.

(invited) University of Michigan, Fall 2022 Chemical Engineering Seminar Series, Ann Arbor, MI. "Designing catalysts and chemical processes for global sustainability," T.F. Jaramillo, November 2022.

(invited) Southeast Regional Meeting of the American Chemical Society (SERMACS) 2022, San Juan, Puerto Rico "Catalysts, interfaces, and devices for solar-driven H production and CO2 reduction", T.F. Jaramillo, October 2022.

(invited) TotalEnergies "Meet the Expert" Sessions, Virtual Seminar, "Electrified processes for CO2 conversion: Design principles for catalysts, interfaces, and reactors," T.F. Jaramillo, October 2022.

(invited) Energy@Stanford & SLAC, Stanford University, Stanford, CA, "Developing catalysts and processes for the future production and use of H2," T.F. Jaramillo, September 2022.

(invited) 2022 Stanford Chemical Engineering Convocation, Stanford University, Stanford, CA "Developing Catalysts and Chemical Processes for Sustainability," T.F. Jaramillo, September 2022.

(invited) Technical University of Denmark, SurfCat Summer School 2022 "Developing methods, materials, and devices in electrocatalysis and photocatalysis for energy-conversion reactions," T.F. Jaramillo, August 2022.

(invited) International Conference on Carbon Dioxide Utilization (ICCDU) 2022, Princeton University, Princeton, NJ, "CO2 electro-reduction: Design principles for catalysts, interfaces, and systems," T.F. Jaramillo, June 2022.

(invited) Caltech Energy 10, California Institute of Technology, Pasadena, CA. "Decarbonizing fuels, chemicals, and materials," T.F. Jaramillo, June 2022.

(invited) University of California, Irvine, UCI Solutions that Scale Seminar Series, Virtual. "Designing catalysts and chemical processes for global sustainability," T.F. Jaramillo, June 2022.

(invited) NAM27 – The 27th North American Catalysis Society Meeting, New York "Designing Catalysts and Chemical Processes for Global Sustainability," T.F. Jaramillo, May 2022.

(invited) Stanford Energy Solutions Week – Frontiers in Energy Technology, Precourt Institute for Energy, Stanford University, Stanford, CA. "Developing sustainable technologies for H2 production," T.F. Jaramillo, May 2022.

(invited) Tata Delegation visit to Stanford University, Stanford, CA. "Advances in Electrochemistry to Enable a Sustainable Society," T.F. Jaramillo, May 2022.

(invited) University of Rochester, Department of Chemical Engineering 2020 Su Lecture, Rochester, NY. "Catalyzing chemical transformations for global sustainability," T.F. Jaramillo, April 2022.

(invited) University of Wisconsin-Madison, Seminar Department of Chemical Engineering, Madison, WI. "Developing catalysts and chemical processes of global sustainability," T.F. Jaramillo, April 2022.

(invited) University of Utah, Department of Chemistry, Virtual. "Catalyzing chemical transformations for global sustainability," T.F. Jaramillo, February 2022.

(invited) University of California, Berkeley, Nano Seminar Series, Berkeley, CA. "Catalyzing chemical transformations for global sustainability" T.F. Jaramillo, February 2022.

2021

(keynote) Electrochemical Conversion of CO_2 to Green Fuels and Products Workshop, NSERC CREATE ME2, Materials for Electrochemical Energy, Virtual Meeting. "Designing catalysts and processes for the electrochemical conversion of CO_2," T.F. Jaramillo, December 2021.

2021 Annual Meeting of the American Institute of Chemical Engineers (AIChE) Virtual Conference. "Catalyzing Hydrogen Production in Water Electrolysis and Solar Photoelectrochemistry," T.F. Jaramillo, November 2021.

(invited) 240th Meeting of the Electrochemical Society (ECS), Virtual Meeting. "Electrocatalysts for Water-Splitting: Design, Development, and Integration Into Devices for Water Electrolysis and Solar Photoelectrochemical (PEC) Hydrogen Production," T.F. Jaramillo, October 2021.

(invited) Chemical Engineering Department Town Hall, Stanford University. T.F. Jaramillo, October 2021.

(keynote) MRS-ACS Conference, Chemistry and Materials Science: Enabling a Sustainable Future, Virtual Workshop. "The Hydrogen Economy and Beyond," T.F. Jaramillo, November 2021.

(invited) University of Texas at Austin, Texas Materials Institute Seminar Series (Virtual). "Catalyzing a sustainable future: Developing new processes for the chemical and energy sectors," T.F. Jaramillo, October 2021.

(invited) Chevron Colloquium, Webinar. "Catalyzing a sustainable future: Developing new processes for the chemical and energy sectors," T.F. Jaramillo, October 2021.

(keynote) nanoGe Fall Meeting, Online Conference. "From fundamentals to applications: Insights into electrocatalysis and the pathway towards technology development," T.F. Jaramillo, October 2021.

(invited) The Future of Renewable Electricity Production and Storage, Nanoscale Prototyping Laboratory Affiliate Program, Virtual Meeting. "Electricity conversion to fuels and chemicals," T.F. Jaramillo, September 2021.

(invited) Energy @ SLAC & Stanford, Virtual Meeting, "Designing and developing catalysts for the future of H2: Addressing activity, selectivity, stability, and scalability," T.F. Jaramillo, September 2021.

(invited) US DOE Earth Shots, Hydrogen Shot Summit, Virtual Meeting. "Advanced Pathways for H2 Production – Photoelectrochemistry," T.F. Jaramillo & F. Houle, September 2021.

(keynote) US-German workshop series on artificial photosynthesis, Virtual Meeting. "Designing and developing catalysts for artificial photosynthesis: Addressing activity, selectivity, stability, and scalability," T.F. Jaramillo, September 2021.

(Invited) 72nd Annual Meeting of the International Society of Electrochemistry, Jeju Island, Korea, Virtual/Hybrid Meeting. "Developing catalysts and design principles for CO2 electro-reduction: From fundamentals to high performance systems," T.F. Jaramillo, September 2021.

(Invited) US DOE Earth Shots, Hydrogen Shot Summit, Virtual Meeting. "Advanced Pathways for H2 Production – Photoelectrochemistry," T.F. Jaramillo & F. Houle, September 2021.

(Invited) Hyundai NGV, Virtual Webinar. "Developing Sustainable Pathways to Fuels and Chemicals II: Routes to Carbon-based Fuels and Chemicals," T.F. Jaramillo, August 2021.

(Invited) Hyundai NGV, Virtual Webinar. "Developing Sustainable Pathways to Fuels and Chemicals I: Routes to Green Hydrogen (H2)," T.F. Jaramillo, August 2021.

(invited) US DOE Yellow Team Meeting, Virtual Meeting. "Tuning electrochemical CO2 reduction (CO2R) at the catalyst microenvironment: ZnCu bimetallics," T.F. Jaramillo, August 2021.

(Invited) American Chemical Society (ACS) Fall 2021 National Meeting, Presidential Symposium: New Frontiers and Opportunities for Chemistry, Atlanta, GA, Hybrid/Virtual Meeting. "Catalyzing chemical transformations for global sustainability," T.F. Jaramillo, August 2021.

(Invited) American Chemical Society (ACS) Fall 2021 National Meeting, Carbon Capture and Utilization: Conversion of CO2 to Chemicals and Fuels Symposium, Atlanta, GA, Hybrid/Virtual Meeting. "Insights into the electrochemical conversion of CO2 to fuels and chemicals," T.F. Jaramillo, August 2021.

(Invited) Exploring Nitrogen Activation Mechanisms Telluride Workshop, Virtual Meeting. "Approaches for electrochemical ammonia production: Challenges and opportunities," T.F. Jaramillo, June 2021.

(Invited) DOE Hydrogen Program 2021 Annual Merit Review and Peer Evaluation Meeting, Virtual. "Protective Catalyst Systems on III-V and Si-based Semiconductors for Efficient, Durable Photoelectrochemical Water Splitting Devices," T.F. Jaramillo, June 2021.

(Invited) Stanford University Energy Seminar, Stanford, CA, Virtual. "Catalyzing a Sustainable Future: Developing New Processes for the Chemical and Energy Sectors," T.F. Jaramillo, May 2021.

(Invited) Verbund Advisory Board Discussions, Virtual. "Deep Dive on Hydrogen (H2):
Potential of various H2 carriers (NH3/CH3OH/LOHC/ e-fuels)," T.F. Jaramillo, March 2021.

(Invited) Graduate Pathways to STEM, Virtual. "How to Prepare for Funding Graduate School," T.F. Jaramillo, February 2021.

(Invited) University of Toronto Webinar, Toronto, Canada. "Developing catalysts and processes for the sustainable production of fuels and chemicals," T.F. Jaramillo, January 2021.

2020

(Invited) National Renewable Energy Laboratory (NREL) Seminar Series, Golden, CO. "Approaches to electrochemical ammonia production: Challenges and opportunities," T.F. Jaramillo, November 2020.

(Invited) Natural Gas Initiative (NGI) Industrial Affiliates Meeting, Stanford, CA. "Electrochemical conversion of gaseous hydrocarbons," T.F. Jaramillo, October 2020

(Invited) StorageX International Symposium, Stanford, CA. "Electricity to fuels and chemicals: H_2, carbon-based products, and NH_3," T.F. Jaramillo, October 2020.

(Invited) Energy@Stanford and SLAC, Stanford Graduate Summer Institute, Stanford, CA. "Sustainable pathways for the production of fuels and chemicals," T.F. Jaramillo, September 2020.

(Invited) 2020 Solar Fuels Science Meeting, Joint Center for Artificial Photosynthesis (JCAP), "Electrocatalytic Conversion of CO_2 and CO to Fuels and Chemicals: Mechanistic Insights and Catalyst Development," T.F. Jaramillo, August 2020.

(Invited) Virtual Meeting on Solar Fuels, https://materialsociania.com. "Electron and Photon Driven Processes for H_2 Production and the Conversion of CO_2 to Fuels and Chemicals," T.F. Jaramillo, July 2020.

(Invited) 24th Annual Green Chemistry & Engineering Conference: Systems-Inspired Design, Virtual Conference, American Chemical Society. "Developing new catalysts and processes for the sustainable production of fuels and chemicals," T.F. Jaramillo, April 2020.

(Invited) BP Webinar, "Electrolysis processes for the sustainable production of fuels and chemicals," T.F. Jaramillo, April 2020.

(Invited) NCCC, The Netherlands' Catalysis and Chemistry Conference, Noordwijkerhout, Netherlands. "Catalyst development for the sustainable production of fuels and chemicals," T.F. Jaramillo, March 2020.

(Invited) Graduate Pathways to STEM, University of California, Berkeley, CA. "How to Prepare for Funding Graduate School," T.F. Jaramillo, February 2020.

2019

(Invited) V-Sustain Center Meeting, Technical University of Denmark (DTU), Kgs. Lynbgy, Denmark. "N_2 Reduction to NH_3," T.F. Jaramillo, December 2019.

(Invited) Total LEX Meeting, Stanford University, Stanford, CA. "CO_2 conversion: Opportunities to spin out innovation," T.F. Jaramillo, December 2019.

(Invited) Chemical Sciences Roundtable, Advances, Challenges, and Long-Term Opportunities of Electrochemistry: Addressing Societal Needs, National Academies of Sciences, Engineering, and Medicine, Washington, D.C. "Designing new catalysts and processes for the sustainable production of fuels and chemicals," T.F. Jaramillo, November 2019.

(Invited) Annual Meeting of the American Institute of Chemical Engineering (AIChE), Orlando, FL. "Steering selectivity in CO_2 electrocatalysis towards value-added fuels and chemicals," T.F. Jaramillo, November 2019.

(Invited) Department of Chemical and Biomolecular Engineering, Rice University, Houston, TX. "Catalyst design and development for sustainable fuels and chemicals," T.F. Jaramillo, October 2019.

(Invited) 236th Meeting of The Electrochemical Society (ECS), Atlanta, GA. "Materials Discovery and Development for the Sustainable Production of Fuels and Chemicals," T.F. Jaramillo, October 2019.

(Invited) Natural Gas Initiative (NGI) Affiliates Meeting, Stanford, CA. "Electrochemical methane conversion, and related chemistries for power-to-gas" T.F. Jaramillo, October 2019.

(Invited) Natural Gas Initiative (NGI) Affiliates Meeting, Stanford, CA. "Activation of Methane at Platinum Electrodes under Ambient Conditions" T.F. Jaramillo, October 2019.

(Invited) Sustainability Innovation Day 2019, Gore Innovation Center, Santa Clara, CA. "New, sustainable routes to fuels and chemicals," C. Hahn and T.F. Jaramillo, October 2019.

(Invited) Energy@SLAC&Stanford Conference 2019, Stanford Graduate Summer Institute (SGSI), Stanford University, Stanford, CA. "Electricity conversion to fuels and chemicals" T.F. Jaramillo, September 2019.

(Invited) The 8th Asia Pacific Congress on Catalysis (APCAT-8), Bangkok, Thailand. "Design and development of catalysts and sustainable processes for the conversion of water and CO_2 to H_2 and carbon-based fuels and chemicals," T.F. Jaramillo, August 2019.

(Invited) Stanford Energy Global Council: The Future of Transportation, Stanford, CA. "Electricity to fuels and chemicals," T.F. Jaramillo, August 2019.

(Invited, poster) DOE BES Catalysis Science Program PI Meeting, Gaithersburg, MD. "Fundamental Understanding and Catalyst Development for Electrochemical Processes Involving H_2O, H_2, O_2, and H_2O_2," M. Hubert, Z. Chen, S. Chen, A. Strickler, Y. Cui, F. Abild-Pedersen, C. Hahn, D. Higgins, L.A. King, Samira S. Siahrostami, Z. Bao, J.K. Nørskov, T.F. Jaramillo, July 2019.

(Keynote) 2019 North American Catalysis Society Meeting (NAM26), Chicago, IL. "The Interplay between Activity and Selectivity on Cu-Based Catalysts for the Electrochemical Reduction of CO_2 to Fuels and Chemicals," T.F. Jaramillo, June 2019.

(Invited) Catalytic Activity in Complex Environments: 1st Workshop on Sorption, Binding, and Catalysis, Pacific Northwest National Laboratory, Richland, WA. "Developing electrocatalysts and interfaces for sustainable processes," T.F. Jaramillo, June 2019.

(Plenary) 2019 Junior Technical Meeting (JTM) & Puerto Rico Interdisciplinary Scientific Meeting (PRISM) University of Puerto Rico, Mayagüez, PR. "Developing catalyst materials for sustainable energy," T.F. Jaramillo, May 2019.

(Invited) 2019 DOE Hydrogen and Fuel Cells Annual Merit Review, Crystal City, VA. "Protective Catalyst Systems on III-V and Si-based Semiconductors for Efficient, Durable Photoelectrochemical Water Splitting Devices," T.F. Jaramillo & J. Harris, April 2019.

(Invited) 2019 Materials Research Society (MRS) Spring Meeting & Exhibit, Phoenix, AZ. "Catalyst Development for Water Electrolysis and Fuel Cell Reactions Involving H_2, O_2, H_2O, and H_2O_2," T.F. Jaramillo, April 2019.

(Invited) 2019 Materials Research Society (MRS) Spring Meeting & Exhibit, Phoenix, AZ. "Development of Catalytic Coatings for H_2-Producing Photocathodes in Solar Water-Splitting," T.F. Jaramillo, April 2019.

(Invited) International Bunsen Discussion Meeting: Fundamentals and Applications of (Photo) Electrolysis for Efficient Energy Storage, Taormina, Sicily, Italy. "Electrocatalyst design and development for the production of H_2 and the conversion of CO_2 to fuels and chemicals," T.F. Jaramillo, April 2019.

(Invited) Stanford Hydrogen Focus Group Workshop, Stanford University, Stanford, CA. "Electrochemical H_2 Generation," T.F. Jaramillo, March 2019.

(Invited) CERA Week, Houston, TX. "Catalyzing the sustainable production of fuels and chemicals," T.F. Jaramillo, March 2019.

(Invited) Stanford University Faculty Senate Meeting, Stanford, CA. "Processes and practices in faculty searches," T.F. Jaramillo, March 2019.

(Invited) Yale University, Department of Chemistry, Inorganic Chemistry Seminar, New Haven, CT. "New catalysts for the sustainable production and use of fuels and chemicals," T.F. Jaramillo, February 2019.

(Invited) University of Southern California, Mork Family Department of Chemical Engineering and Materials Science, Los Angeles, CA. "Developing catalysts and sustainable processes for the production and use of fuels and chemicals," T.F. Jaramillo, February 2019.

(Invited) Cornell University, Materials Science & Engineering Seminar, Ithaca, NY. "Developing catalysts and sustainable processes for the production and use of fuels and chemicals," T.F. Jaramillo, February 2019.

(Invited) Hydrogen Production Tech Team (HPTT) Meeting, WebEx. "Protective Catalyst Systems on III-V and Si-based Semiconductors for Efficient, Durable Photoelectrochemical Water Splitting Devices" T.F. Jaramillo & J. Harris, February 2019.

(Invited) Tufts University, Department of Chemistry Seminar, Medford, MA. "New catalysts and sustainable processes for the production and use of fuels and chemicals," T.F. Jaramillo, January 2019.

2018

(Invited) Uppsala University, Ångstrom Laboratory, Symposium on Solar Fuels, Uppsala, Sweden. "New catalysts and new routes for the sustainable production of fuels and chemicals" T.F. Jaramillo, December 2018.

(Invited) Massachusetts Institute of Technology Inorganic Chemistry seminar, Cambridge, MA. "Developing Catalysts and Processes for the Sustainable Production of Fuels and Chemicals" T.F. Jaramillo, December 2018.

(Invited) UC Davis Energy Graduate Group Seminar Series, Davis, CA. "Developing new catalysts and processes for the sustainable production of fuels and chemicals" T.F. Jaramillo, November 2018.

(Invited) 2018 Invitational Lecture Series UOP Honeywell in Des Plaines, IL. "Developing new catalysts and processes for the sustainable production of fuels and chemicals" T. F. Jaramillo *November 2018.*

(Invited) 2018 AIChE Annual Meeting in Pittsburg, PA. “Integrating Non-Precious Metal H_2 Evolution Catalysts into Water Electrolyzers and Photoelectrochemical Water-Splitting Devices” T. F. Jaramillo October 2018.

(Invited) National Academy of Sciences Sackler Colloquium – Status and Challenges in Science for Decarbonizing our Energy Landscape in Irvine, CA. “Developing new catalysts and sustainable processes for the production and use of fuels and chemicals” T. F. Jaramillo October 2018.

(Invited) Current Challenges in Catalysis Research Workshop in Copenhagen, Denmark. “Catalyst development for sustainable processes involving fuels and chemicals” T. F. Jaramillo October 2018.

(Invited) MIT-Stanford Energy Game Changers Symposium in Washington, DC. “Fuels for Industry: Can we economically produce hydrogen from water?” T.F. Jaramillo September 2018.

(Invited) Bosch Energy Research Network (BERN) Symposium in Sunnyvale, CA. "Catalyst development for sustainable energy technologies: fuel cells and water electrolysis" T.F. Jaramillo September 2018.

(Invited) 69th Annual ISE Meeting in Bologna, Italy. "Design and development of catalytic interfaces for electrochemical and photoelectrochemical processes" T.F. Jaramillo September 2018.

(Invited) CCI (Center for Chemical Innovation) Solar Fuels Capstone Meeting in Ventura, CA. "The past, present, and future of photoanodes for photoelectrochemical (PEC) water-splitting" T.F. Jaramillo July 2018.

(Invited) GRC Catalysis Conference: Accelerating Catalytic Solutions to Global Grand Challenges in Colby-Sawyer, NH. "Catalyzing Electrochemical Processes for Sustainable Energy" T.F. Jaramillo, June 2018.

(Invited) 4th International Conference on Electrochemistry in Rome, Italy. "Design and development of catalyst materials for the production of fuels and chemicals in a sustainable manner" T.F. Jaramillo June 2018.

(Invited) 233rd ECS (The Electrochemical Society) Meeting in Seattle, WA. “Challenges and Opportunities Involving Electrochemical Processes for the Sustainable Production of Ammonia” and “Towards Unassisted Water-Splitting Systems: Development of Catalysts, Semiconductors, and Interfaces” T.F. Jaramillo May 2018.

(Invited) École Polytechnique Fédérale de Lausanne (EPFL) Winter School: Challenges and Opportunities in Energy Research, Crans-Montana, Valais, Switzerland. “Catalyst development for sustainable processes involving electrochemical transformations” T.F. Jaramillo, March 2018.

(Invited) University of Texas - El Paso, Department of Chemistry, El Paso, TX. “Developing new materials and processes for the sustainable production of fuels and chemicals” T.F. Jaramillo, February 2018.

(Invited) Hydrogen Production Tech Team (HPTT) Meeting, WebEx. "Protective Catalyst Systems on III-V and Si-based Semiconductors for Efficient, Durable Photoelectrochemical Water Splitting Devices" T.F. Jaramillo, February 2018.

(Invited) The Future of Renewable Transportation, Stanford Energy 3.0 Workshop, Stanford University, Stanford, CA. "Carbon-free Production of H_2, NH_3, and Carbon-based Fuels and Chemicals" T.F. Jaramillo, February 2018.

(Invited)" Renewable Energy: Solar Fuels Gordon Research Conference, Ventura, CA. Electrocatalyst Design and Development for Key Reactions in Solar Fuels" T.F. Jaramillo, January 2018.

2017

(Invited) Department of Chemical and Petroleum Engineering, University of Pittsburgh, Pittsburgh, PA. "Developing catalysts and interfaces for the sustainable production of fuels and chemicals" T.F. Jaramillo, December 2017.

(Invited) PPG Industries, Pittsburgh, PA. "Materials development for the sustainable production of fuels and chemicals" T.F. Jaramillo, November 2017.

(Invited) HydroGEN Kickoff Meeting, National Renewable Energy Laboratory, Golden, CO. "Protective Catalyst Systems on III-V and Si-based Semiconductors for Efficient, Durable Photoelectrochemical Water Splitting Devices" T.F. Jaramillo, November 2017.

(Invited) Louisiana State University, Student Chapter of The Electrochemical Society, Baton Rouge, LA. "Developing catalysts and interfaces for the sustainable production of fuels and chemicals" T.F. Jaramillo, November 2017.

(Invited) Natural Gas Initiative (NGI) Affiliates Meeting, Stanford, CA. "Insights from Mission Innovation planning for a clean energy research agenda" T.F. Jaramillo, November 2017.

(Invited) Natural Gas Initiative (NGI) Workshop, Advances in conversion of methane to fuels and chemicals, Stanford, CA. "Electrochemical processes for the conversion of methane: Challenges and opportunities" T.F. Jaramillo, November 2017.

(Invited) 5th Arab-American Frontiers of Science, Engineering, and Medicine Symposium, Rabat, Morocco. "Developing New Pathways for the Production of Fuels and Chemicals in a Sustainable Manner" T.F. Jaramillo, November 2017.

(Invited) Shell Technology Center Houston, Houston, TX. "Catalyst development for the sustainable production of fuels and chemicals" T.F. Jaramillo, October 2017.

(Invited) Graduate Pathways to Science Technology Engineering and Mathematics (STEM), Stanford, CA. "How to Fund Graduate School" T.F. Jaramillo, October 2017.

(Invited) SurfCat, Department of Physics, Technical University of Denmark, Kgs. Lyngby, DK. "Catalyst design and development for the sustainable production of fuels and chemicals" T.F. Jaramillo, September 2017.

(Invited) Energy@SLAC&Stanford Conference 2017, Stanford Graduate Summer Institute (SGSI), Stanford University, Stanford, CA. "Sustainable Routes to Fuels and Chemicals" T.F. Jaramillo, September 2017.

(Invited) SUNCAT Summer Institute, SLAC National Accelerator Laboratory, CA. "New Strategies Toward Sustainable Electrochemical Ammonia Synthesis" August 2017.

(Invited, poster) DOE Annual Merit Review (AMR), Washington D.C. "Engineering Surfaces, Interfaces, and Bulk Materials for Unassisted Solar Photolectrochemial (PEC) Water Splitting" T.F. Jaramillo, June 2017.

(Invited 231st Meeting of the Electrochemical Society, New Orleans, LA. "Electrocatalyst Development for Hydrogen and Oxygen Evolution: From Fundamentals to Application in Electrolysis Devices" T.F. Jaramillo, May 2017.

(Invited 231st Meeting of the Electrochemical Society, New Orleans, LA. "Catalysts and Interfaces for Hydrogen Production by Solar Photoelectrochemistry" T.F. Jaramillo, May 2017.

(Invited) Celebrating the 50th Anniversary of UCSB Chemical Engineering, Santa Barbara, CA. "Reflections from a UCSB ChemE alum: Foundations for a future career ahead" T.F. Jaramillo, April 2017.

(*Invited)* 253rd American Chemical Society (ACS) National Meeting & Exposition, San Francisco, CA. "Electrocatalyst design and development for the Oxygen Evolution Reaction (OER) and the electro-reduction of CO_2," T.F. Jaramillo, April 2017.

2016

(Invited) 2016 DOE BES Catalysis Science PI Meeting, Gaithersburg, MD. "Engineering surfaces and nanomaterials for H_2 and O_2 electrocatalysis," T.F. Jaramillo, J. Kibsgaard, A. Strickler, P. Chakthranont, L.C. Seitz, June 2016.

(Invited) Laboratoire d'Electrochimie Moléculaire, Dept. of Chemistry, Université Paris Diderot - Paris 7 Paris, France. "Engineering electrocatalyst materials for the CO_2 reduction reaction (CO_2RR)," T.F. Jaramillo, June 2016.

(Invited) Laboratoire d'Electrochimie Moléculaire, Dept. of Chemistry, Université Paris Diderot - Paris 7 Paris, France. "Splitting water by electrolysis and solar photoelectrochemistry: Fundamentals and applications," T.F. Jaramillo, June 2016.

(Invited, poster) 2016 DOE Hydrogen and Fuel Cells Program and Vehicle Technologies Office Annual Merit Review (AMR), Washington, D.C. "NSF/DOE Solar Hydrogen Fuel: Engineering Surfaces, Interfaces, and Bulk Materials for Unassisted Solar Photoelectrochemical (PEC) Water Splitting," T.F. Jaramillo, June 2016.

(Invited) Electronic Materials Symposium, IBM Almaden Research Center, San Jose, CA. "Materials for the sustainable production of fuels and chemicals," T.F. Jaramillo, May 2016.

(Invited) Fundamental X-Ray Science and its Application to Catalysis and Water Research: Future Directions, FYSIKUM, AlbaNova, Stockholm University, Stockholm, Sweden. "Catalysts and devices for the sustainable production of fuels and chemicals," T.F. Jaramillo, May 2016.

(Invited) Manfred-Eigen-Nachwuchswissenschaftlergespräch: Physical Chemistry of Solar Fuels Catalysis, Max-Planck-Institut für Chemische Energiekonversion, Mülheim an der Ruhr, Germany. "Catalysts, materials, and devices for solar fuels," T.F. Jaramillo, April 2016.

(Invited) 2016 Materials Research Society (MRS) Spring Meeting & Exhibit, Phoenix, AZ. "Catalyst development and integration onto semiconductors for solar H_2 production by photoelectrochemical (PEC) water-splitting," T.F. Jaramillo, J.D. Benck, T.R. Hellstern, R. Britto, J. Young, T. Deutsch, J. Kibsgaard, C.J. Hahn, L.C. Seitz, I. Narkeviciute, P. Chakthranont, K.D. Fong, March 2016.

(Invited) 251st American Chemical Society (ACS) National Meeting & Exposition: Research Opportunities for Future Energy Technologies, San Diego, CA. "Hydrogen generation and fuel cells: Current status, research challenges, and future prospects," T.F. Jaramillo, March 2016.

(Invited) Gordon Research Seminar: Solar Energy Conversion to Fuels, Lucca (Barga), Italy. "Catalysts, materials, and devices for solar fuels," T.F. Jaramillo, February 2016.

(Invited) TeraWatts, TeraGrams, TeraLiters 2016: Workshop on Challenges and Opportunities for Future Sustainable Production of Chemicals and Fuels, Santa Barbara, CA. "Unconventional routes to conventional chemicals" T.F. Jaramillo, February 2016.

2015

(Invited) Pacifichem: The International Chemical Congress of Pacific Basin Societies, Honolulu, HI. "Electrocatalytic CO_2 reduction to fuels and chemicals: Insights into transition metal surfaces," T.F. Jaramillo, December 2015.

2015 Annual Meeting of the American Institute of Chemical Engineers (AIChE), Salt Lake City, UT. "The State of Development of Hydrogen and Oxygen Evolving Electrocatalysts for Solar-Fuels Generating Devices," T.F. Jaramillo, J. Kibsgaard, J.D. Benck, L.C. Seitz, J.W.D. Ng, T.R. Hellstern, C.C.L. McCrory, S. Jung, I. Ferrer, S. Chatman, and J.C. Peters, November 2015.

(Invited) Netherlands Center for Multiscale Catalytic Energy Conversion (MCEC) School, Driebergen, Netherlands. "Generating fuels from sunlight: Catalyst design, development, and integration into devices," T.F. Jaramillo, October 2015.

(Invited) AVS 62nd International Symposium & Exhibit, San Jose, CA. "Engineering Surfaces and Interfaces for Photoelectochemical (PEC) Water-Splitting," T.F. Jaramillo, J.D. Benck, J. Kibsgaard, T.R. Hellstern, C.J. Hahn, P. Chakthranont, R. Britto, and K.D. Fong, October 2015.

(Invited) Energy Seminar, Stanford University, Stanford, CA. "Developing Sustainable Pathways to Fuels and Chemicals," T.F. Jaramillo, September 2015.

(Invited) Energy@SLAC&Stanford Conference 2015, Stanford Graduate Summer Institute (SGSI), Stanford University, Stanford, CA. "Developing a Sustainable Pathway to Fuels and Chemicals," T.F. Jaramillo, September 2015.

(Invited) SUNCAT Summer Institute 2015, Stanford University, Stanford, CA. “Energy Transformations: Designing and developing electrocatalysts and photoelectrodes,” T.F. Jaramillo, August 2015.

(Invited) 2015 DOE BES Catalysis Science PI Meeting: Benchmarking Catalysis Science, Annapolis, MD. “Developing and benchmarking electrocatalysts for solar fuels: The hydrogen evolution reaction (HER) & the oxygen evolution reaction (OER),” T.F. Jaramillo, July 2015.

North American Meeting, NAM 24: Catalysis at the Confluence of Science and Technology, North American Catalysis Society, Pittsburgh, PA. “Developing electrocatalysts for H_2 evolution and their integration onto semiconductors for direct solar water-splitting,” T.F. Jaramillo, J. Kibsgaard, J. Benck, T.R. Hellstern, and R. Britto, June 2015.

(poster) 2015 DOE Hydrogen and Fuel Cells Program and Vehicle Technologies Office Annual Merit Review (AMR), Crystal City, VA. “NSF/DOE Solar Hydrogen Fuel: Engineering Surfaces, Interfaces, and Bulk Materials for Unassisted Solar Photoelectrochemical (PEC) Water Splitting,” T.F. Jaramillo, June 2015.

(Invited) Stanford Energy 3.0, Stanford University, Stanford, CA. "Producing Renewable Fuels and Chemicals from CO_2 and H_2O," T.F. Jaramillo, May 2015.

(Invited) University of Puerto Rico, Cayey. "Developing New Pathways for the Sustainable Production of Fuels and Chemicals, T.F. Jaramillo, April 2015.

(Invited) University of Puerto Rico, Río Piedras, Department of Chemistry. "Developing New Pathways for the Sustainable Production of Fuels and Chemicals, T.F. Jaramillo, April 2015.

(Invited) University of Puerto Rico, Mayagüez, Department of Chemical Engineering. "Developing New Pathways for the Sustainable Production of Fuels and Chemicals, T.F. Jaramillo, April 2015.

(Invited) Massachusetts Institute of Technology (MIT), Department of Chemical Engineering, Cambridge, MA. "Developing Sustainable Routes for the Production of Fuels and Chemicals," T.F. Jaramillo, April 2015.

(Invited) Materials Research Society, 2015 Spring Meeting & Exhibit, San Francisco, CA. "Challenges and opportunities in engineering materials for solar photoelectrochemical (PEC) water-splitting," T.F. Jaramillo, J.D. Benck, T.R. Hellstern, R. Britto, J. Kibsgaard, L. Seitz, I. Narkeviciute, P. Chakthranont, K.D. Fong, April 2015.

(Invited) Materials Research Society, 2015 Spring Meeting & Exhibit, San Francisco, CA. "From catalysts to devices: Fuel cells, regenerative fuel cells, and water electrolyzers," T.F. Jaramillo, J.W.D. Ng, A. Jackson, A.L. Strickler, L.C. Seitz, J.D. Benck, April 2015.

(Invited) Third Biennial Carbon Dioxide Workshop, Princeton University, Princeton, NJ. "Trends in transition metal surfaces for the electrocatalytic reduction of CO_2 to fuels and chemicals," T.F. Jaramillo, March 2015.

(Invited) Stanford Energy Seminar, Stanford University, Stanford, CA. "A Precious-Metal Free Regenerative Fuel Cell for Storing Renewable Electricity," T.F. Jaramillo, March 2015.

(Invited) Global Climate Energy Project (GCEP) Roundtable 2015: Long-Range Vision for Renewable Fuels in the Global Energy System, Los Altos, CA. "Long-Range Vision for Renewable Fuels in the Global Energy System," T.F. Jaramillo, January 2015.

(Invited) Global Climate Energy Project (GCEP) Roundtable 2015: Long-Range Vision for Renewable Fuels in the Global Energy System, Los Altos, CA. "Sustainable Production of Fuels and Chemicals," T.F. Jaramillo, January 2015.

2014

(Invited) École Polytechnique Fédérale de Lausanne (EPFL), Department of Mechanical Engineering, Lausanne, Vaud, Switzerland. "Catalyzing new routes for the sustainable production of fuels and chemicals," T.F. Jaramillo, December 2014.

2014 Annual Meeting American Institute of Chemical Engineers (AIChE), Atlanta, GA. "Molybdenum sulfide materials to provide catalytic activity and surface protection for active and stable water splitting photocathodes," T.F. Jaramillo, November 2014.

(Invited) Volkswagen/BASF Science Award Electrochemistry, Stanford University, Stanford, CA. "Designing and developing catalysts and devices for renewable energy," T.F. Jaramillo, November 2014.

(Invited) Global Climate and Energy Project (2014) Symposium, Stanford, CA. "Energy Tutorial: Synthetic Fuels," T.F. Jaramillo, October 2014.

(Invited) Global Climate and Energy Project (2014) Symposium, Stanford, CA. "Design Principles for Catalyzing CO_2 Electro-Reduction to Fuels and Chemicals on Transition Metal Surfaces," T.F. Jaramillo, J.K. Nørskov, A. Nilsson, October 2014.

(Invited) SusTech 2014, Sustainable Chemical Technologies Summit, University of California, Santa Barbara, CA. "Catalyzing New Routes for the Sustainable Production of Fuels and Chemicals," T.F. Jaramillo, September 2014.

(Invited) 2014 Pacific Coast Catalysis Society Meeting, Stanford University, Stanford, CA. "Developing electrocatalysts for renewable energy technologies," September 2014.

(Invited) Energy@Stanford and SLAC, 2014 Conference: Energy Research for the 21st Century, "Sustainable Pathways to Produce Fuels and Chemicals," T.F. Jaramillo & L. Seitz, September 2014.

(Invited) Department of Chemical Engineering Seminar Series, California Institute of Technology, Pasadena, CA. "Designing and Developing Catalysts for Electrochemical Reactions Involving H_2, O_2, and CO_2," T.F. Jaramillo, September 2014.

(Keynote) The 65th Annual Meeting of the International Society of Electrochemistry (ISE), Lausanne, Switzerland. "Designing and Developing Catalysts for Electrochemical Reactions Involving H_2, O_2, and CO_2," T.F. Jaramillo, J. Kibsgaard, J.D. Benck, T.R. Hellstern, K.D. Fong, A. Jackson, K.P. Kuhl, E.R. Cave, D.N. Abram, T. Hatsukade, C.J. Hahn, and J. Feaster, September 2014.

(Invited) 2014 CINF Summer School: Reactivity of nanoparticles for more efficient and sustainable energy production – III, Kobæk Strand, Denmark. "Developing nanostructured materials and interfaces for solar photoelectrochemical (PEC) H_2 Production," T.F. Jaramillo, August 2014.

(Invited) Gordon Research Conference on Electrodeposition: Electrochemical Materials Synthesis and Applications, University of New England, Biddeford, ME. "Bifunctional Manganese Oxide Catalysts: Challenges and Opportunities for Sustainable Energy," T.F. Jaramillo, July 2014.

(Invited) 2014 Meeting of the Catalysis Science Program: Frontiers at the Interface of Homogeneous and Heterogeneous Catalysts II, Chemical Sciences, Geosciences and Biosciences Division, Office of Basic Energy Sciences, U.S. Department of Energy, Annapolis, Maryland. "Engineering electrocatalysts at the nano-scale for the hydrogen evolution reaction (HER) and the oxygen reduction reaction (ORR)," T.F. Jaramillo, July 2014.

(Invited) California Research Alliance (CARA) Heterogenous Catalysis Workshop by BASF, University of California, Berkeley, CA. "Catalyst development for the renewable, sustainable production of fuels and chemicals," T.F. Jaramillo, July 2014.

(Invited, poster) U.S. DOE Hydrogen and Fuel Cells Program Annual Merit Review, Office of Renewable Energy and Energy Efficiency (EERE), Washington, D.C. "Center on Nanostructuring for Efficient Energy Conversion: Developing Nanomaterials for Water Splitting" T.F. Jaramillo, M. Brongersma, B.M. Clemens, Y. Cui, S. Fan, D. Goldhaber-Gordon, A. Grossman, K. Jacobsen, J. Nørskov, R. Sinclair, X. Zheng, T.M. Gur, S.F. Bent, and F.B. Prinz, June 2014.

(Invited) 2014 Materials Research Society (MRS) Spring Meeting & Exhibit, San Francisco, CA. "Challenges and Opportunities in the (Photo)Electrocatalytic Conversion of CO_2 to Hydrocarbons and Alcohols," T.F. Jaramillo, K.P. Kuhl, E.R. Cave, D.N. Abram, T. Hatsukade, J. Kibsgaard, J. Feaster, C.J. Hahn, April 2014.

(Plenary) 2nd International Conference on Clean Energy Science (ICCES2), Qingdao, People's Republic of China. "Mechanistic insights into the electrochemical conversion of CO_2 to fuels and chemicals on transition metal surfaces," T.F. Jaramillo, April 2014.

(Invited) Helmholtz-Institut Erlangen-Nürnberg (HI ERN) –Renewable Energy Production, International Symposium: Recent Achievements and Future Trends in Electrocatalysis, Erlangen, Germany. "Catalyst development for the production of hydrogen by electrolysis and solar photoelectrochemistry," T.F. Jaramillo, April 2014.

(Invited) 247th American Chemical Society (ACS) National Meeting & Exposition: Chemistry and Materials for Energy, Dallas, TX. "Insights into the electrochemical conversion of CO_2 to hydrocarbons and alcohols on transition metals surfaces," T.F. Jaramillo, K.P. Kuhl, E.R. Cave, D.N. Abram, T. Hatsukade, C.J. Hahn, J. Feaster, J. Kibsgaard, March 2014.

(Invited) Environmental Defense Fund (EDF) Science Day: Future Energy Technologies, Sausalito, CA. "Artificial Photosynthesis," T.F. Jaramillo, February 2014.

(Invited) 2014 Gordon Research Conference: Electrochemistry, Ventura, CA. "Electrocatalyst Development for the Synthesis of Renewable Fuels and Sustainable Chemicals," T.F. Jaramillo, January 2014.

2013

(Invited) Stanford University, Department of Materials Science & Engineering, Stanford, CA. "Developing electrocatalyst materials for chemical transformations in renewable energy," T.F. Jaramillo, November 2013.

(Invited) Georgia Institute of Technology, Department of Chemical and Biomolecular Engineering, Atlanta, GA. "Developing active, stable, and selective electrocatalyst materials for chemical transformations in renewable energy," T.F. Jaramillo, November 2013.

(Invited) Netherlands Institute for Catalysis Research (NIOK) and Royal Netherlands Academy of Arts and Sciences (KNAW) Symposium: Catalysis for the Future, Amsterdam, Netherlands. "Developing electrocatalysts to enable the renewable, sustainable production of fuels and chemicals," T.F. Jaramillo, November 2013.

(Invited) 7th Santa Fe Workshop on Materials for Energy Conversion: Alkaline Membrane Fuel Cells, University of New Mexico, Bishop's Lodge Ranch, Santa Fe, NM. "Developments toward a precious-metal-free alkaline anion exchange membrane unitized regenerative fuel cell (AEM-URFC)," T.F. Jaramillo, November 2013.

2013 Annual Meeting of the American Institute of Chemical Engineers (AIChE), Pittsburgh, PA. "Molybdenum Sulfides Materials as Hydrogen Evolution Catalysts and Surface Protecting Layers for Highly Active and Stable Silicon-Based Water Splitting Photocathodes," T.F. Jaramillo, J. Benck, Z. Chen, J. Kibsgaard, B.N. Reinecke, November 2013.

(Invited) International Institute for Carbon-Neutral Energy Researh (I^2CNER) Symposium: Catalytic Concepts for Energy, University of Illinois, Urbana-Champaign, IL. "Developing electrocatalysts for the synthesis of renewable fuels and sustainable chemicals," T.F. Jaramillo, September 2013.

(Invited) SUNCAT Summer School: Heterogeneous Catalysis for Energy Transformations, SLAC National Accelerator Laboratory, Menlo Park, CA. "Electrocatalytic Conversion of CO_2 to Fuels and Chemicals on Transition Metal Surfaces," T.F. Jaramillo, August 2013.

23rd North American Catalysis Society Meeting (NAM), Louisville, KY. "Electrocatalytic Conversion of Carbon Dioxide to Fuels and Chemicals on Transition Metal Electrodes," T.F. Jaramillo, K.P. Kuhl, E.R. Cave, D.N. Abram, T. Hatsukade, June 2013.

(Invited) U.S. DOE Hydrogen and Fuel Cells Program Annual Merit Review, Office of Renewable Energy and Energy Efficiency (EERE), Crystal City, VA. "Solar hydrogen production by photoelectrochemical (PEC) water-splitting: Advancing technology through the synergistic activities of the PEC working group (PEC WG)," T.F. Jaramillo, May 2013.

(Invited) Center for Catalytic Science and Technology at the University of Delaware, Newark, DE. "Catalyzing chemical transformations in renewable energy: Tailoring Electrocatalyst Materials for Activity, Selectivity, and Stability," T.F. Jaramillo, May 2013.

(Invited) Harvard University Center for the Environment (HUCE), Materials for Energy Seminar Series, Cambridge, MA. "Catalyzing key chemical transformations for renewable, sustainable energy," T.F. Jaramillo, May 2013.

(Invited) 4th Annual Center for Molecular Analysis and Design (CMAD) Symposium, Stanford, CA. "Catalyzing Electrochemical Transformations in Renewable Energy," T.F. Jaramillo, May 2013.

(Invited) 2013 Materials Research Society (MRS) Spring Meeting & Exhibit, San Francisco, CA. "Exploring Nano-architectures of MoS_2: How Surface Structure and Electronic Structure Impact H_2 Production by Electrocatalysis and Solar Photoelectrochemistry," T.F. Jaramillo, April 2013.

(Invited) 2013 Center for Electrochemistry (CEC) Workshop on Electrochemistry, University of Texas at Austin. "The Impact of Surface Structure on the Electrocatalytic and Photoelectrochemical (PEC) Properties of MoS_2," T.F. Jaramillo, February 2013.

2012

(Invited) Lawrence Berkeley National Laboratory, "Developing Electrocatalysts for the Synthesis of Renewable Fuels," T.F. Jaramillo, December 2012.

(Invited) University of New Mexico, Dept. of Chemical and Nuclear Engineering, "Tailoring electrocatalyst materials to enhance activity, stability, and selectivity for key energy conversion reactions," T.F. Jaramillo, December 2012.

(Invited) Massachusetts Institute of Technology, Dept. of Mechanical Engineering, "Tailoring electrocatalyst materials to enhance activity, stability, and selectivity for key energy conversion reactions," T.F. Jaramillo, November, 2012.

(Invited) 2012 Fall Meeting of the Materials Research Society (MRS), Boston, MA. "Insights into the electrochemical conversion of CO_2 to fuels and chemicals on transition metal surfaces," T.F. Jaramillo, K.P. Kuhl, E.R. Cave, D.N. Abram, T. Hatsukade, November 2012.

(Invited) Princeton University, Dept. of Chemical and Biological Engineering Colloquium, "Catalyzing chemical transformations in renewable energy: Tailoring electrocatalyst materials for activity, selectivity, and stability," T.F. Jaramillo, November 2012.

(Invited) 2012 Annual Meeting of the American Institute of Chemical Engineers (AIChE), Pittsburgh, PA. "A tutorial on electrocatalysis: Concepts, fundamentals, methods, and applications," T.F. Jaramillo, November 2012.

(Invited) Fall 2012 Conference on Batteries and Energy Storage, Energy & Environment Affiliates Program, Stanford University, Stanford, CA. "Energy Storage by Means of Renewable Fuels," T.F. Jaramillo, November 2012.

2012 Annual Meeting of the American Institute of Chemical Engineers (AIChE), Pittsburgh, PA. "Engineering the Surface Structure of MoS_2 Through Morphological Control At the Nano-Scale for Enhanced Electrocatalytic Hydrogen Production," T.F. Jaramillo, Z. Chen, J. Kibsgaard, B.N. Reinecke, October 2012.

(Invited) Global Climate Energy Project Annual Research Symposium: Creating a Bright Energy Future, Stanford University, Stanford, CA. "Electrocatalysis 101" T.F. Jaramillo, October 2012.

(Invited) 222nd Meeting of the Electrochemical Society, PRiME Pacific Rim Meeting on Electrochemical and Solid-State Science, Honolulu, HI. "The electrocatalytic conversion of CO_2 to fuels and chemicals," T.F. Jaramillo, Kendra P. Kuhl, Etosha R. Cave, David N. Abram, Toru Hatsukade, October 2012.

(Invited) University of California, Berkeley, Department of Chemical and Biomolecular Engineering, "Tailoring electrocatalyst materials to enhance activity, stability, and selectivity for key energy conversion reactions," T.F. Jaramillo, October 2012.

(Invited) The Future of Catalysis: Symposium in Honor of Jens Norskov's 60th Birthday, SLAC National Laboratory, Menlo Park, CA. "Electrocatalyst development for renewable energy: Engineering surface structure at the atomic-scale by controlling morphology at the nano-scale," T.F. Jaramillo, September 2012.

(Invited) 2012 PIRE-CCI Summer School, Dalian, China. "Electrocatalyst development for the synthesis of renewable fuels from water and CO_2," T.F. Jaramillo, September 2012.

(Invited) CASE-CINF Summer School, Reactivity of Nanoparticles for More Efficient and Sustainable Energy Conversion II, Kobaek Strand, Denmark. "Solar Fuels by Photocatalysis and Photoelectrochemistry," T.F. Jaramillo, August 2012.

(Invited) U.S. DOE Hydrogen and Fuel Cells Program Annual Merit Review, Office of Renewable Energy and Energy Efficiency (EERE), Crystal City, VA. "Directed Nano-scale and Macro-scale Architectures for Semiconductor Absorbers and Transparent Conducting Substrates for Photoelectrochemical Water Splitting," T.F. Jaramillo, A. Forman, Z. Chen, B.A. Pinaud, L. Seitz, A. Jackson, May 2012.

(Invited) United Technologies Research Center, Hartford, CT. "Tailoring Electrocatalyst Materials at the Nano-Scale: Controlling Activity, Selectivity, and Stability for Energy Conversion Reactions," T.F. Jaramillo, April 2012.

(Invited) Spring Meeting of the Materials Research Society (MRS), San Francisco, CA. "Bridging the gap between optical absorption and charge transport in metal oxide materials for the synthesis of solar fuels," T.F. Jaramillo, A.J. Forman, Z. Chen, I. Thomann, B.A. Pinaud, I.S. Cho, D.R. Kim, P.M. Rao, B.M. Clemens, X. Zheng, M. Brongersma, April 2012.

(Invited) University of California, Santa Barbara. "Tailoring Electrocatalyst Materials at the Nano-Scale: Controlling Activity, Selectivity, and Stability for Energy Conversion Reactions," T.F. Jaramillo, March 2012.

(Invited) Stanford University, Dept. of Mechanical Engineering, High Temperature Gas Dynamics Laboratory Seminar Series, Stanford, CA. "Tailoring Electrocatalyst Materials at the Nano-Scale: Controlling Activity, Selectivity, and Stability for Energy Conversion Reactions," T.F. Jaramillo, March 2012.

(Invited) Powering the Planet, a Chemical Center for Innovation, Huntington Beach, CA. "Addressing charge transport limitations in thin film Ta_3N_5 & TaON photoanodes for solar fuel synthesis," T.F. Jaramillo & B.A. Pinaud, January 2012.

2011

(Invited) Massachusetts Institute of Technology (MIT), Energy Initiative Seminar Series, Cambridge, MA. "Tailoring Electrocatalyst Materials at the Nano-Scale: Controlling Activity, Selectivity, and Stability for Energy Conversion Reactions," T.F. Jaramillo, December 2011.

(Invited) University of California, Berkeley, Applied Science & Technology, Berkeley, CA. "Catalyzing the production of clean fuels from renewable energy resources," T.F. Jaramillo, December 2011.

(Invited) Fall Meeting of the Materials Research Society (MRS), Boston, MA. "Advanced electrode and photo-electrode structures for the synthesis of fuels from sunlight," T.F. Jaramillo, A.J. Forman, Z. Chen, B.A. Pinaud, J.D. Benck, S.-H. Baeck, Y. Gorlin, E. Cave, K.P. Kuhl, November 2011.

(Invited) California Institute of Technology, Chemical Engineering Department Seminar, Pasadena, CA. "Tailoring Electrocatalyst Materials at the Nano-Scale: Controlling Activity, Selectivity, and Stability for Energy Conversion Reactions," T.F. Jaramillo, October 2011.

(Invited) University of New Mexico, Chemical and Nuclear Engineering Department Seminar, Albuquerque, NM. "Tailoring Electrocatalyst Materials at the Nano-Scale: Controlling Activity, Selectivity, and Stability for Energy Conversion Reactions," T.F. Jaramillo, October 2011.

2011 Annual Meeting of the American Institute of Chemical Engineers (AIChE), Minneapolis, MN. "Electrocatalytic Conversion of CO2 to Fuels on Metal Surfaces," T.F. Jaramillo, K.P. Kuhl, E. Cave, and D.N. Abram, October 2011.

2011 Annual Meeting of the American Institute of Chemical Engineers (AIChE), Minneapolis, MN. "Double Gyroid Nanostructured Platinum As Highly Durable Oxygen Reduction Reaction Electrocatalyst," T.F. Jaramillo, J. Kibsgaard, and Y. Gorlin, October 2011.

(Invited) US Department of Energy, Basic Energy Sciences (DOE BES) Catalysis Contractor's Meeting, Annapolis, MD, "Nanostructured electrocatalysts for energy conversion reactions," T.F. Jaramillo, October 2011.

(Invited) Catalysis for Sustainable Energy (CASE) Seminar Series, Technical University of Denmark, Lyngby, DK. "Tailoring electrocatalyst materials at the nano-scale: Controlling activity, selectivity, and stability for energy conversion reactions," T.F. Jaramillo, August 2011.

(Invited) Haldor Topsøe Catalysis Forum: Catalysis & Future Energy, Munkerupgaard, DK. "Semiconductors and catalysts for the production of solar fuels," T.F. Jaramillo, August 2011.

(Invited) Lawrence Livermore National Laboratory, Livermore, CA. "Tailoring electrocatalyst materials at the nano-scale: Controlling activity and selectivity for energy conversion reactions," T.F. Jaramillo, July 2011.

(Invited) Global Climate Energy Project (GCEP) Distinguished Lectureship Series, Exxon Mobil Corporation, Clinton, NJ. "Tailoring electrocatalyst materials at the nano-scale: Controlling activity and selectivity for energy conversion reactions," T.F. Jaramillo, June 2011.

(Invited) Global Climate Energy Project (GCEP) Distinguished Lectureship Series, General Electric Corporation, Niskayuna, NY. "Tailoring electrocatalyst materials at the nano-scale: Controlling activity and selectivity for energy conversion reactions," T.F. Jaramillo, June 2011.

(Invited) Global Climate Energy Project (GCEP) Distinguished Lectureship Series, Schlumberger, Inc. Cambridge, MA. "Tailoring electrocatalyst materials at the nano-scale: Controlling activity and selectivity for energy conversion reactions," T.F. Jaramillo, June 2011.

(Invited) Energy Frontier Research Center (EFRC) Summit & Forum, Washington, D.C. "Engineering catalysts at the nano-scale for energy conversion reactions," T.F. Jaramillo, May 2011.

(Invited) U.S. Department of Energy (DOE) Energy Efficiency & Renewable Energy (EERE) Hydrogen Program Annual Merit Review (AMR) 2011. "Nano-architectures for 3rd generation PEC devices: A study of MoS_2, fundamental investigations and applied research," T.F. Jaramillo, May 2011.

(Invited) Santa Clara University, Department of Chemistry, Santa Clara, CA. "Nanomaterials for efficient chemical transformations in energy conversion reactions," T.F. Jaramillo, May 2011.

(Invited) Sanford University Energy & Environment Affiliates Program, Stanford, CA. "Nanostructured Catalysts for Chemical Transformations in Energy," T.F. Jaramillo, May 2011.

(Invited) Materials Research Society (MRS) National Meeting, San Francisco, CA. "Electrocatalytic conversion of CO_2 to fuels on metal surfaces," T.F. Jaramillo, April 2011.

(Invited) Helios Solar Energy Research Center, University of California at Berkeley, Berkeley, CA. "Non-precious metal catalysts for electrochemical transformations between H_2, O_2, and H_2O" T.F. Jaramillo, April 2011.

(Invited) 241st American Chemical Society National Meeting & Exposition, Anaheim, CA. "Electrocatalysis on manganese oxide surfaces: Oxygen reduction and water oxidation," March 2011.

2010

(Invited) Global Climate Energy Project, Sixth Annual Research Symposium: Creating a Sustainable Energy System for the 21st Century & Beyond, Stanford University, Stanford, CA. "Developing solid-state electrocatalysts based on design principles from nature: The oxidation of water and the reduction of CO_2 to fuels" T.F. Jaramillo, September 2010.

(Invited) Nordic Symposium on Catalysis, Marienlyst, Denmark. "Bi-functional electrocatalysis on manganese oxide surfaces: oxygen reduction and water oxidation" T.F. Jaramillo, August 2010.

(Invited) Technical University of Denmark, Dept. of Physics, Lyngby, Denmark. "Nano-structured materials for the synthesis of fuels from sunlight" T.F. Jaramillo, August 2010.

(Invited) DOE Hydrogen Review Meeting, Washington, D.C. "Nanostructured MoS_2 and WS_2 for the solar production of hydrogen" T.F. Jaramillo, June 2010.

(Keynote, Invited) Molecular Aspects of Catalysis by Sulfides, MACS V Conference, Copenhagen, Denmark. "Nano-scaled MoS_2 for solar hydrogen production" T.F. Jaramillo, June 2010.

(Invited) Copenhagen University, 2010 Workshop for PhD Students in Nanoscience, Copenhagen, Denmark. "Nano-scaled materials for the synthesis of fuels from sunlight" T.F. Jaramillo, May 2010.

(Invited) Technical University of Denmark, CASE-Helios Workshop, Lyngby, Denmark. "In pursuit of a reversible oxygen electrode: Water oxidation and oxygen reduction on electro-catalytic oxide surfaces" T.F. Jaramillo, May 2010.

(Invited) California Institute of Technology, Division of Chemistry and Chemical Engineering Seminar, Pasadena, CA. "Nano-scaled materials for the synthesis of fuels from sunlight" T.F. Jaramillo, May 2010.

(Invited) Woods Energy Seminar, Stanford University, Stanford, CA. "Nano-scaled materials for the synthesis of fuels from sunlight" T.F. Jaramillo, April 2010.

(Invited) Ipatieff Prize Symposium in Honor of Christopher W. Jones, 239th American Chemical Society National Meeting & Exposition, San Francisco, CA. "Surface electrocatalysis for fuel synthesis: Inspiration from nature" T.F. Jaramillo, March 2010.

(Invited) University of California – Santa Cruz, Dept. of Chemistry and Biochemistry Colloquium, Santa Cruz, CA. "Nano-scaled materials for the synthesis of fuels from sunlight" T.F. Jaramillo, February 2010.

2009

(Invited) University of California – Berkeley, Dept. of Chemical Engineering Colloquium, Berkeley, CA. "Nano-scaled materials for the synthesis of fuels from sunlight" T.F. Jaramillo, December 2009.

2009 Annual Meeting of the American Institute of Chemical Engineers (AIChE), Nashville, TN. "Nanostructured MoS_2 for the Photoelectrochemical Production of Hydrogen" T.F. Jaramillo, November 2009.

(Invited) University of Texas – Austin, Dept. of Chemical Engineering Colloquium, Austin, Texas. "Nano-scaled materials for the synthesis of fuels from sunlight" T.F. Jaramillo, October 2009.

(Invited) Global Climate Energy Project, Fifth Annual Research Symposium: New Research Directions in a Rapidly Evolving Global Energy Landscape, Stanford University, Stanford, CA. "Nano-structured MoS_2 and WS_2 for the Solar Production of Hydrogen" T.F. Jaramillo, October 2009.

(Invited) Technical University of Denmark, Dept. of Physics, Lyngby, Denmark. "Nano-scaled semiconductors and novel catalysts for the synthesis of fuels from sunlight" T.F. Jaramillo, September 2009.

(Invited) Summer School: Catalysis for a Sustainable Energy, Sønderborg, Denmark. "Photon absorbers and energy conversion catalysts: New approaches to solar fuels" T.F. Jaramillo, August 2009.

(*Invited, poster*) 2009 US DOE/BES Catalysis Sciences Meeting, Annapolis, MD. "Designing new electrocatalysts: A case study of the hydrogen evolution reaction (HER)" T.F. Jaramillo, June 2009.

(Invited) 2009 US DOE Hydrogen Program and Vehicle Technologies Annual Merit Review & Peer Evaluation Meeting, Arlington, VA. "Nanostructured MoS_2 and WS_2 for the solar production of hydrogen" T.F. Jaramillo, May 2009.

(Invited) US DOE Photoelectrochemical Hydrogen Production Quarterly Meeting, San Francisco, CA. "Nanostructured MoS_2 and WS_2 for the solar production of hydrogen" T.F. Jaramillo, April 2009.

237th American Chemical Society National Meeting & Exposition, Salt Lake City, UT. "Designing new electrocatalysts for the hydrogen evolution reaction (HER): combining theory and experiment" T.F. Jaramillo, K.P. Jørgensen, J. Bonde, J. Greeley, J. Zhang, B.L. Ooi, J.H. Nielsen, S. Horch, J. Ulstrup, J.K. Nørskov, I. Chorkendorff, March 2009.

(Invited) University of California, Berkeley, Nanosciences and Nanoengineering Institute (BNNI), Nanoscale Science and Engineering (NSE) Seminar, Berkeley, CA. "Designing nano-scaled, non-precious metal catalysts for hydrogen evolution" T.F. Jaramillo, K.P. Jørgensen, J. Bonde, J. Greeley, J. Zhang, B.L. Ooi, J.H. Nielsen, S. Horch, J. Ulstrup, J.K. Nørskov, I. Chorkendorff, March 2009.

(Invited) Chevron Corporation, Richmond, CA, May 2009. "Solar Fuels by Photoelectrochemistry (PEC)" T.F. Jaramillo, March 2009.

(Invited) US DOE Hydrogen Production Technical Team Review: Photoelectrochemical Hydrogen Production, San Francisco, CA. "Nanostructured MoS_2 and WS_2 for the solar production of hydrogen" T.F. Jaramillo, January 2009.

2008

(*Invited*) University of Puerto Rico, Rio Piedras, Department of Chemistry. "Electrocatalytic materials for the hydrogen evolution reaction." T.F. Jaramillo, November 2008.

(*Invited*) Stanford University, Department of Materials Science and Engineering. "Designing electrocatalysts for the hydrogen evolution reaction." T.F. Jaramillo, October 2008.

(*Invited*) American Chemical Society West Regional Conference, Las Vegas, Nevada. "Designing non-noble metal electrocatalysts: An investigation of the hydrogen evolution reaction." T.F. Jaramillo, September 2008.

(*Invited*) Technical University of Denmark, Department of Physics. "Solar fuels by photoelectrochemistry: Prospects and challenges." T.F. Jaramillo, September 2008.

(*Invited*) Inha University, Incheon, South Korea, Department of Chemical Engineering. "Designing new electrocatalytic materials for the hydrogen evolution reaction (HER)." T.F. Jaramillo, July, 2008.

14th International Congress on Catalysis, Seoul, South Korea. "Precious-metal and non-precious metal based nano-scale electrocatalysts for electrocatalytic hydrogen evolution." T.F. Jaramillo, J. Ulstrup, J.K. Nørskov, I. Chorkendorff, July, 2008.

(*Invited*) Twentieth Canadian Symposium on Catalysis, Kingston, Ontario, Canada. "Designing novel electrocatalytic materials: a case study of the hydrogen evolution reaction (HER)." T.F. Jaramillo, K.P. Jørgensen, J. Bonde, J.H. Nielsen, I. Chorkendorff, S. Horch, J. Greeley, J.K. Nørskov, J. Zhang, B.L. Ooi, J. Ulstrup, June, 2008.

(*Invited*) Department of Energy Working Group Meeting on Photoelectrochemical Hydrogen Production, Phoenix, AZ. "Non-precious metal electrocatalysts for the hydrogen evolution reaction (HER): Inspiration for designing new PEC materials," T.F. Jaramillo, May, 2008.

(*Invited*) University of Washington, Seattle, Department of Chemical Engineering. "In the pursuit of active, non-precious metal electrocatalysts: A study of the hydrogen evolution reaction (HER)." T.F. Jaramillo, K.P. Jørgensen, J. Bonde, J.H. Nielsen, I. Chorkendorff, S. Horch, J. Greeley, J.K. Nørskov, J. Zhang, B.L. Ooi, J. Ulstrup, April, 2008.

Materials Research Society (MRS) 2008 Spring Meeting, San Francisco, CA. "Developing new hydrogen evolution electrocatalysts: metal surface alloys and nano-scale molybdenum sulfides." T.F. Jaramillo, K.P. Jørgensen, J. Bonde, J. Greeley, J.H. Nielsen, S. Horch, J.K. Nørskov, I. Chorkendorff, March, 2008.

(*Invited*) Department of Energy Working Group Meeting on Photoelectrochemical Hydrogen Production, Santa Barbara, CA. "New materials for electrocatalytic hydrogen production: from alloys to

nanoparticles," T.F. Jaramillo, K.P. Jørgensen, J. Bonde, S. Horch, J.H. Nielsen, I. Chorkendorff, February, 2008.

2007

American Institute of Chemical Engineers (AIChE) 2007 Annual Meeting, Salt Lake City, Utah. "Nano-scale molybdenum sulfides for electrocatalytic hydrogen evolution," T.F. Jaramillo, K.P. Jørgensen, J. Bonde, S. Horch, J.H. Nielsen, I. Chorkendorff, November 2007.

ISHHC XIII, International Symposium on Relations between Homogeneous and Heterogeneous Catalysis, Berkeley CA. "From alloys to bio-mimetic materials: searching for new hydrogen evolution electrocatalysts," T.F. Jaramillo, K.P. Jørgensen, J. Bonde, J. Greeley, S. Saadi, E. Fernandez, J. Zhang, B.L. Ooi, J.H. Nielsen, S. Horch, J. Ulstrup, J.K. Nørskov, I. Chorkendorff, July 2007.

(I*nvited*) Lundbeck Foundation Center for Atomic-Scale Materials Design (CAMD) Symposium, Lyngby Denmark. "From theory to experiment: New electrocatalysts for the hydrogen evolution reaction," T.F. Jaramillo, K.P. Jørgensen, J. Bonde, J. Greeley, J.H. Nielsen, S. Horch, J.K. Nørskov, I. Chorkendorff, February 2007.

2006

The Electrochemical Society Society 2006 Joint International Meeting, Cancun, Mexico. "Electrocatalysis at nanometer and sub-nanometer scales: Hydrogen evolution on supported MoS_2 and Mo_3S_4 clusters," T.F. Jaramillo, K.P. Jørgensen, S. Saadi, J. Bonde, E. Fernandez, J. Zhang, B.L. Ooi, J.H. Nielsen, S. Horch, J. Ulstrup, J.K. Nørskov, I. Chorkendorff, November 2006.

(*invited*) NanoDay at DTU, Technical University of Denmark, Lyngby, Denmark. "New materials for hydrogen evolution: From alloys to nanoparticles," T.F. Jaramillo, K.P. Jørgensen, J. Bonde, J. Greeley, J.H. Nielsen, S. Horch, J.K. Nørskov, I. Chorkendorff, September 2006.

(*invited*) 5^{th} International Conference on Electrocatalysis, Kotor, Montenegro. "Nanoparticulate MoS_2 electrocatalysts for hydrogen evolution," T.F. Jaramillo, K.P. Jørgensen, J. Bonde, S. Horch, J.H. Nielsen, I. Chorkendorff, September 2006.

(*invited*) Center for Individual Nanoparticle Functionality, External Review, Lyngby, Denmark. "New materials for hydrogen production: Nanoparticulate molybdenum sulfides," T.F. Jaramillo, K.P. Jørgensen, S. Saadi, J. Bonde, E. Fernandez, J. Zhang, B.L. Ooi, J.H. Nielsen, S. Horch, J. Ulstrup, J.K. Nørskov, I. Chorkendorff, June 2006.

(*invited*) Danish Strategic Research Council Contractors Meeting, Copenhagen, Denmark. "New electrode materials for hydrogen production: A focus on nanoparticulate molybdenum sulfides," T.F. Jaramillo, K.P. Jørgensen, S. Saadi, J. Bonde, E. Fernandez, J. Zhang, B.L. Ooi, J.H. Nielsen, S. Horch, J. Ulstrup, J.K. Nørskov, I. Chorkendorff, June 2006.

(*invited*) NABIIT Review Meeting, Technical University of Denmark, Lyngby Denmark. "Biocatalysis and biomimetics for electrochemical hydrogen conversion. Electrocatalysis at the sub-nanometer scale: structure and function of supported Mo_3S_4 clusters," T.F. Jaramillo, S. Saadi, J. Bonde, J. Zhang, J. Kristensen, B.L. Ooi, J. Ulstrup, J.K. Nørskov, I. Chorkendorff, May 2006.

2005

(*invited*) Towards a Hydrogen Society, Technical University of Denmark, Lyngby, Denmark. "Photoelectrochemical hydrogen production: a combinatorial investigation of ZnO-based materials," T.F. Jaramillo, S.-H. Baeck, A. Kleiman-Shwarsctein, E.W. McFarland, August 2005.

(*invited*) University of California Los Angeles, Chemical Engineering Department, Los Angeles, California, "Doped semiconductors and mixed-metal nanoparticles: New materials for energy conversion reactions," T.F. Jaramillo, S. Jayaraman, S.-H. Baeck, A. Kleiman-Shwarsctein, E.W. McFarland, April 2005.

(*invited*) Technical University of Denmark, Physics Department, Lyngby, Denmark, "New materials for energy conversion reactions: photoelectrochemical hydrogen production and electrocatalytic methanol oxidation," T.F. Jaramillo, S. Jayaraman, S.-H. Baeck, A. Kleiman-Shwarsctein, E.W. McFarland, April 2005.

American Chemical Society (ACS) 229th National Meeting, San Diego, California, "Mixed-metal nanoparticles for fuel cell catalysis," T.F. Jaramillo, S. Jayaraman, E.W. McFarland, March 2005.

(*invited*) Stanford University, Chemical Engineering Department, Stanford, California, "New materials for photoelectrochemical hydrogen production: A high-throughput investigation," T.F. Jaramillo, S.-H. Baeck, A. Kleiman-Shwarsctein, E.W. McFarland, March 2005.

(*invited*) National Renewable Energy Laboratory, Golden, Colorado, "High throughput investigation of new materials for the photoelectrochemical production of hydrogen," T.F. Jaramillo, S.-H. Baeck, A. Kleiman-Shwarsctein, E.W. McFarland, February 2005.

KAIST-UCSB "Partners Across the Globe" Symposium, Santa Barbara, California, "Combinatorial Discovery: New Materials for Photoelectrochemical Hydrogen Production," T.F. Jaramillo, S.-H. Baeck, A. Kleiman-Shwarsctein, E.W. McFarland, February 2005.

2004

Electrochemical Society (ECS) Joint International Meeting (206th), Honolulu, Hawaii, "High-throughput methods for the investigation of photoelectrochemical hydrogen production from $Zn_{1-x}Co_xO$ thin films," T.F. Jaramillo, S.-H. Baeck, A. Kleiman-Shwarsctein, E.W. McFarland, October 2004.

University of California, Santa Barbara, Chemical Engineering Department, "Optimized Materials for Photoelectrochemical Hydrogen Production," T.F. Jaramillo, June 2004.

2003

International Energy Agency (IEA) ANNEX-14 Expert Meeting on Photoelectrochemical Hydrogen Production, Paris, France, "Combinatorial Investigation of New Materials for Photoelectrochemical Hydrogen Production," T.F. Jaramillo, S.-H. Baeck, A. Kleiman-Shwarsctein, K.-S. Choi, G.D. Stucky, E.W. McFarland, April 2003.

U.S. Department of Energy (DOE) Expert Meeting on Photoelectrochemical Hydrogen Production, Golden, Colorado, "Photoelectrochemical Hydrogen Production Using New Combinatorial Chemistry Derived Materials", T.F. Jaramillo, S.-H. Baeck, A. Kleiman-Shwarsctein, E.W. McFarland, March 2003.

American Chemical Society (ACS) 225th National Meeting, New Orleans, Louisiana, "Combinatorial Electrochemical Synthesis and Screening of Transition-Metal Doped Zinc Oxides as Water-Splitting Photocatalysts for H_2 Production" T.F. Jaramillo, K.-S. Choi, S.-H. Baeck, E.W. McFarland, March 2003.

2000

American Institute of Chemical Engineers (AIChE) 2000 Annual Meeting, Los Angeles, California, "The Investigation of Photoelectrochemical Hydrogen Production Using Combinatorial Chemistry," T.F. Jaramillo, A. Ivanovskaya, C. Brändli, E.W. McFarland, November 2000.

Issued Patents

"Macro-Structured High Surface Area Transparent Conductive Oxide Electrodes Fabricated via Low Cost, Scalable, Solution Phase Routes," Arnold J. Forman, Zhebo Chen, Thomas F. Jaramillo.
U.S. Patent No.: 9,227,224.
Date of Patent: January 5, 2016

"Platinum and palladium alloys suitable as fuel cell electrodes" Jens K. Nørskov, Jeff Greeley, Ifan Stephens, Alexander Bondarenko, Tobias Johansson, Heine A. Hanson, Thomas Jaramillo, Jan Rossmeisl, Ib Chorkendorff.
U.S. Patent No.: 9,312,545
Date of Patent: April 12, 2016

"Electrochemical sensor," Beth L. Pruitt, Thomas Jaramillo, Tom Larsen, Frédéric Loizeau, Denis Spitzer, Pierre-Alexandre Gross.
U.S. Patent No.: 10,261,046
Date of Patent: April 16, 2019

"Electro-thermochemical Li cycling for NH_3 synthesis from N_2 and H_2O" Joshua M. McEnaney, John Schwalbe, Aayush Ranjan Singh, John Lin, Jakob Kibsgaard, Thomas F. Jaramillo, Matteo Cargnello, Jens K. Nørskov.
U.S. Patent No.: 10,479,693
Date of Patent: November 19, 2019

Research Team: Graduate students, post-doctoral scholars, and staff

Current Graduate Students (total = 15): Sihe Zhang, Rachel Spurlock, Daniela Marín, Kyra Yap, Katherine Yan, Tristan Gilbert, Jesse Matthews, Wrayzene Willoughby, Milenia Rojas Mendoza, Isabela Ríos Amador, Ashton Aleman, Colin Crago, Yamilé Cornejo Carrillo, Nhi Tran, Alfred Vargas

Current post-doctoral scholars (total = 8): Zhixing Wu, Peng Zhu, Judith Zander, Junjie Chen, Sang-Won Lee, Ryan Hannagan, Ezgi Erdem, Hussein Badr

Current research staff (total = 1): Dong Un (Daniel) Lee.

PhD Graduates (total = 40): Gaurav Kamat (PhD, 2024), Valerie Niemann (PhD 2024), Kabir Abiose (PhD, 2024), Lingze (Lily) Wei (PhD, 2023), Jaime Avilés Acosta (PhD, 2023), José Zamora Zeledón (PhD, 2022), Sam Dull (PhD, 2022), Sarah Blair (PhD, 2022), David Koshy (PhD, 2021), Eduardo Valle (PhD, 2021), McKenzie Hubert (PhD, 2021), Melissa Kreider (PhD, 2021), Micha Ben-Naim (PhD,

2021), Daniel Corral (PhD, 2021), David Palm (PhD, 2021), Joel Sánchez (PhD, 2020), Alan Landers (PhD, 2020), Michael Boyd (PhD, 2020), Stephanie Nitopi (PhD, 2019), Zhihua (Bill) Chen (PhD, 2019), Brenna Gibbons (PhD, 2019), Reuben Britto (PhD, 2019), Alaina Strickler (PhD, 2019), Jonathan Snider (PhD, 2018), Ieva Narkeviciute (PhD, 2017), Jeremy Feaster (PhD, 2017), Pong Chakthranont (PhD, 2017), Thomas Hellstern (PhD, 2017), Toru Hatsukade (PhD, 2016), David N. Abram (PhD, 2015), Etosha R. Cave (PhD, 2015), Jesse D. Benck (PhD, 2015), Jia-Wei Desmond Ng (PhD, 2015), Linsey C. Seitz (PhD, 2015), Ariel Jackson (PhD, 2014), Benjamin N. Reinecke (PhD, 2013), Blaise A. Pinaud (PhD, 2013), Kendra P. Kuhl (PhD, 2013), Yelena Gorlin (PhD, 2012), Zhebo Chen (PhD, 2012).

Former post-doctoral scholars (total = 34): Aniket Mule, Johanna Schröder (Karlsruhe Institute of Technology, KIT), Peter Benedek, Yi (Sheldon) Xu, Joseph Perryman, Dong Un Lee (Assoc. Staff Researcher, Stanford), (Lei Wang (National University of Singapore), Yi-Rung Lin (co-Founder, CarbonClean Energy), Sarah Lamaison (co-Founder, Dioxycle), David Wakerley (co-Founder, Dioxycle), Joshua McEnaney (co-Founder, Nitricity), Michaela Burke Stevens (Stanford Associate Staff, Research Engineer), Adam Nielander (Stanford Associate Staff, Research Engineer), Andrew Wong (National University of Singapore), D. Ches Upham (Univ. of British Columbia), Anna-Louise Jongerius (Avantium Chemicals), Antaeres Dawn Antoniuk-Pablant, Alessandro Gallo (Sila Nanotechnologies), Amber Janda, Arindom Saha, Arnold J. Forman (Bio-Logic), Carlos Gilberto Morales Guío (UCLA), Chris Hahn (LLNL), Drew Higgins (McMaster University), Jakob Kibsgaard (Technical University of Denmark), Lauren King (Manchester Metropolitan University), Marat Orazov (University of Delaware), María Escudero-Escribano (University of Copenhagen), Maureen Tang (Drexel University), Melis Duyar (University of Surrey), Peter Vesborg (Technical University of Denmark), Samuel Fleischman (SLAC), Shin-Jung Choi, Zhi Wei Seh (Agency for Science, Technology, and Research, Singapore).