

**Thomas William Hamann**  
Michigan State University  
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## EDUCATION

Ph.D. 2006, Chemistry    California Institute of Technology    Advisor: Nathan Lewis  
*Thesis: "Interfacial electron-transfer reactions at semiconductor electrodes"*

M.S. 2000, Chemistry    University of Massachusetts, Boston    Advisor: Hans Van Willigen  
*Thesis: "FT-EPR study of electron transfer reactions mediated by the photo-excited triplets of a C<sub>60</sub> adduct"*

B.A. 1996, Chemistry    University of Texas, Austin

## PROFESSIONAL EXPERIENCE

Professor	Michigan State University	2018 – present
Director	CORE-Complex Materials	2018 – present
Associate Editor	ACS Applied Materials & Interfaces	2017 – present
James Dye Professor	Michigan State University	2014 – present
Associate Professor	Michigan State University	2013 – 2018
Assistant Professor	Michigan State University	2008 – 2013
Postdoctoral Fellow w/ Prof. Joseph Hupp	Northwestern University	2006 – 2008

## RESEARCH INTERESTS

Inorganic chemistry, material synthesis, homogeneous and heterogeneous electron-transfer reactions and catalysis, atomic layer deposition, photovoltaic and photoelectrochemical cells.

## AWARDS

- 2016 Camille and Henry Dreyfus Environmental Chemistry Mentor
- 2015 Kavli Fellow
- 2015 SEAC Royce W. Murray Young Investigator Award
- 2013 Camille Dreyfus Teacher-Scholar
- 2012 Alfred P. Sloan Research Fellowship
- 2012 National Science Foundation, CAREER award
- 2011 Department of Energy, Early Career Research Program award

## PUBLICATIONS

### **Book Chapters:**

- 1) Hajibabaei, H., Gao, Y., Hamann, T.W “Unravelling the Charge Transfer Mechanism in Water Splitting Hematite Photoanodes.” In *Advances in Photoelectrochemical Water Splitting: Theory, Experiment and Systems Analysis*; The Royal Society of Chemistry, **2018**; pp 100 – 127.

### **Peer Reviewed Articles:**

- 72) Hajibabaei, H., Little, D.J., Pandey, A., Wang, D., Mi, Z., Hamann, T.W “Direct Deposition of Crystalline Ta<sub>3</sub>N<sub>5</sub> Thin Films on FTO for PEC Water Splitting.” *ACS Applied Materials & Interfaces* **2019**, 11 (17), 15457 – 15466.
- 71) Qing, G., Hamann, T.W.; “New Electrolytic Devices Produce Ammonia with Exceptional Selectivity” *Joule* **2019**, 3 (3) 634 – 636
- 70) He, Y., Vanka, S., Gao, T., He, D., Espano, J., Zhao, Y., Dong, Q., Lang, C., Wang, Y., Hamann, T.W., Mi, Z., Wang, D. *Nano Research*, **2019**, DOI: 10.1007/s12274-019-2346-3
- 69) He, Y., Hamann, T.W., Wang, D.; “Thin film photoelectrodes for solar water splitting” *Chemical Society Reviews* **2019**, DOI: 10.1039/C8CS00868J
- 68) Habib-Zadeh, F., Miller, S.L., Hamann, T.W., Smith, M.R.; “Homogenous Electro-Catalytic Oxidation of Ammonia to N<sub>2</sub> Under Mild Conditions” *Proceedings of the National Academy of Science* **2019**, 116 (8) 2849 – 2853
- 67) Wang, Y., Hamann, T.W.; “Improved Performance Induced by in-situ Ligand Exchange Reactions of Copper Bipyridyl Redox Couples in Dye-Sensitized Solar Cells” *Chemical Communications* **2018**, 54, 12361 – 12364
- 66) Baillargeon, J., Xie, Y., Raithel, A.L., Ghaffari, B., Staples, R.J., Hamann, T.W.; “Spin-Doctoring Cobalt Redox Shuttles for Dye-Sensitized Solar Cells” *Inorganic Chemistry* **2018**, 57 (18), 11633 – 11645
- 65) Qiu, J., Hajibabaei, H., Nellist, M.R., Laskowski, F.A.L, Oener, S.Z., Hamann, T.W., Boettcher, S.W.; “Correction to Catalyst Deposition on Photoanodes: The Roles of Intrinsic Catalytic Activity, Catalyst Electrical Conductivity, and Semiconductor Morphology” *ACS Energy Letters* **2018**, 3, 1771 – 1771
- 64) Liu, D., Wang, Q., Elinski, M., Chen, P., Traverse, C.J., Yang, C., Young, M., Hamann, T.W., Lunt, R.R.; “Ultrathin Hole Extraction Layer for Efficient Inverted Perovskite Solar Cells” *ACS Omega* **2018**, 3 (6), 6339 – 6345
- 63) Wang, Q., Jiang, C., Zhang, P., Hamann, T.W.; “Overcoming Bulk Recombination Limits of Layered Perovskite Solar Cells with Mesoporous Substrates” *Journal of Physical Chemistry C* **2018**, 122 (25), 14177 – 14185
- 62) Jiang, C., Xie, Y., Lunt, R.R., Hamann, T.W., Zhang, P.; Elucidating the Impact of Thin Film Texture on Charge Transport and Collection in Perovskite Solar Cells" *ACS Omega* **2018**, 3 (3), 3522 – 3529

- 61) Qiu, J., Hajibabaei, H., Nellist, M.R., Laskowski, F.A.L., Hamann, T.W., Boettcher, S.W.; “Catalyst Deposition on Photoanodes: The Roles of Intrinsic Catalytic Activity, Catalyst Electrical Conductivity, and Semiconductor Morphology” *ACS Energy Letters* **2018**, 3, 961 – 969
- 60) Liu, D., Wang, Q., Traverse, C.J., Yang, C., Young, M., Kuttipillai, P.S., Lunt, S.Y., Hamann, T.W., Lunt, R.R.; “Impact of Ultrathin C60 on Perovskite Photovoltaic Devices” *ACS Nano* **2018**, 12 (1) 876 – 883
- 59) Nellist, M.R., Laskowski, F.A.L., Qiu, J., Hajibabaei, H., Sivula, K., Hamann, T.W., Boettcher, S.W.; “Potential-sensing electrochemical atomic force microscopy enables *in-operando* analysis of electrocatalysis during (photo)electrochemical water splitting” *Nature Energy* **2018**, 3, 46 – 52
- \* *thomson reuters highly cited paper (top 1%)*
- 58) Hajibabaei, H., Hamann, T.W.; “Selective Electrodeposition of Tantalum(V) Oxide Electrodes” *Langmuir* **2017**, 33 (41), 10800 – 10806
- 57) Farha, O., Hamann, T.W., Martinson, A.B.F., Mulfort, K.; “Material and Interfaces for Energy Related Applications” *ACS Applied Materials & Interfaces* **2017**, 9 (39), 33377 – 33378
- 56) Chu, S., Li, W., Yan, Y., Hamann, T.W., Shih, I., Wang, D., Mi, Z.; “Roadmap on Solar Water Splitting: Current Status and Future Prospects” *Nano Futures* **2017**, 1, 022001
- 55) Qiu, J., Hajibabaei, H., Nellist, M.R., Laskowski, F.A.L., Hamann, T.W., Boettcher, S.W.; “Direct in Situ Measurement of Charge Transfer Processes During Photoelectrochemical Water Oxidation on Catalyzed Hematite” *ACS Central Science* **2017**, 3 (9), 1015 – 1025
- 54) Hajibabaei, H., Schon, A.R., Hamann, T.W.; “Interface Control of PEC Water Oxidation Performance with Ni<sub>1-x</sub>Fe<sub>x</sub>O<sub>y</sub> Modified Hematite Photoanodes” *Chemistry of Materials* **2017**, 29 (16), 6674 – 6683
- 53) Gao, Y., Hamann, T.W.; “Elucidation of CuWO<sub>4</sub> Surface States During PEC Water Oxidation” *Journal of Physical Chemistry Letters* **2017**, 8 (12), 2700 – 2704
- 52) Little, D.J., Edwards, D., Smith, M.R., Hamann, T.W.; “As Precious as Platinum: Iron Nitride for Electrocatalytic Oxidation of Liquid Ammonia” *ACS Applied Materials & Interfaces* **2017**, 9 (19), 16228 – 16235
- 51) Baillargeon, J., Xie, Y., Hamann, T.W.; “Bifurcation of Regeneration and Recombination in Dye-Sensitized Solar Cells via Electronic Manipulation of Tandem Cobalt Redox Shuttles” *ACS Applied Materials & Interfaces* **2017**, 9 (39), 33544 – 33548
- 50) Gao, Y., Hamann, T.W.; “Quantitative hole collection for photoelectrochemical water oxidation with CuWO<sub>4</sub>” *Chemical Communications* **2017**, 53, 1285 – 1288
- 49) Hajibabaei, H., Zandi, O., Hamann, T.W.; “Tantalum Nitride Films Integrated with Transparent Conductive Oxide Substrates via Atomic Layer Deposition for Photoelectrochemical Water Splitting” *Chemical Science*, **2016**, 7, 6760 – 6767

- 48) Zandi, O., Hamann, T.W.; “Determination of Photoelectrochemical Water Oxidation Intermediates on  $\alpha$ -Fe<sub>2</sub>O<sub>3</sub> Electrode Surfaces Employing Operando ATR–IR Spectroscopy” *Nature Chemistry*, **2016**, 8, 778 – 783  
\* *thomson reuters highly cited paper (top 1%)*
- 47) Mandal, D., Hamann, T.W.; “Charge distribution in nanostructured TiO<sub>2</sub> photoanodes determined by quantitative analysis of the band edge unpinning” *ACS Applied Materials & Interfaces* **2016**, 8 (1), 419 – 424
- 46) Zandi, O., Schon, A.R., Hajibabaei, H., Hamann, T.W.; “Enhanced Charge Separation and Collection in High Performance Electrodeposited Hematite Films” *Chemistry of Materials*, **2016**, 28 (3), 765 – 771
- 45) Gao, Y., Zandi, O., Hamann, T.W.; “Atomic Layer Stack Deposition-Annealing Synthesis of CuWO<sub>4</sub>” *Journal of Materials Chemistry A*, **2016**, 4, 2826 – 2830
- 44) Xie, Y., Baillargeon, J., Hamann, T.W.; “Regeneration and Recombination Reactions in Dye Sensitized Solar Cells Employing Cobalt Redox Shuttles” *Journal of Physical Chemistry C*, **2015**, 119 (50), 28155 – 28166
- 43) Zandi, O., Hamann, T.W.; “The Potential versus Current State of Water Splitting with Hematite” *Physical Chemistry Chemical Physics*, **2015**, 17, 22485 – 22503
- 42) Little, D.J., Smith, M.R., Hamann, T.W.; “Electrolysis of Liquid Ammonia for Hydrogen Generation” *Energy & Environmental Science*, **2015**, 8, 2775 – 2781
- 41) Mandal, D., Hamann, T.W.; “Energetics of Nanoparticle Semiconductor Electrodes Determined by Spectroelectrochemical Measurements of Free Electrons.” *Physical Chemistry Chemical Physics* **2015**, 17, 11156 – 11160
- 40) Klahr, B., Gimenez, S. Zandi, O., Fabregat-Santiago, F., Hamann, T.W.; “Competitive Photoelectrochemical Methanol and Water Oxidation with Hematite Electrodes.” *ACS Applied Materials & Interfaces* **2015**, 7 (14), 7653 – 7660
- 39) Hamann, T.W.; “Perovskites take lead in solar hydrogen race.” *Science* **2014**, 345, 1566 – 1567
- 51) Young, K.M.H., Hamann, T.W.; “Enhanced photocatalytic water oxidation efficiency with Ni(OH)<sub>2</sub> catalysts deposited on  $\alpha$ -Fe<sub>2</sub>O<sub>3</sub> via ALD.” *Chemical Communications* **2014**, 50 (63) 8727 – 8730
- 37) Kronawitter, C.X., Zegkinoglou, I., Shen, S.H., Liao, P., Cho, I.S., Zandi, O., Lashgari, K., Westin, G., Guo, J.H., Himpfel, F.J., Carter, E.A., Zheng, X.L., Hamann, T.W., Koel, B.E., Mao, S.S., Vayssieres, L.; “On Theoretical and Experimental Titanium Incorporation into Hematite Nanostructures” *Energy and Environmental Science*, **2014**, 7, 3100 – 3121
- 36) Soman, S., Xie, Y., Hamann, T.W.; “Cyclometalated sensitizers for DSSCs employing cobalt redox shuttles” *Polyhedron*, **2014**, 82, 139 – 147
- 35) Zandi, O., Hamann, T.W.; “Enhanced Photovoltage Through Selective Surface State Removal” *Journal of Physical Chemistry Letters* **2014**, 5 (9), 1522 – 1526

- 34) Klahr, B.M.; Hamann, T.W.; “Water Oxidation on Hematite Photoelectrodes: Insight on the Nature and Identity of Surface States through In-situ Spectroelectrochemistry” *Journal of Physical Chemistry C* **2014**, 118 (19), 10393 – 10399
- 33) Zandi, O., Beardslee, J.A., Hamann, T.W.; “Substrate Dependent Water Splitting with Ultrathin  $\alpha$ -Fe<sub>2</sub>O<sub>3</sub> Electrodes” *Journal of Physical Chemistry C* **2014**, 118 (30), 16494 – 16503
- 32) Hamann, T.W.; “Water splitting: An adaptive junction.” *Nature Materials* **2014**, 13, 3 – 4
- 31) Young, M.H., Klahr, B.M., Zandi, O., Hamann, T.W.; “Photocatalytic Water Oxidation with Hematite Electrodes.” *Catalysis Science & Technology*, **2013**, 2013, 3, 1660 – 1671
- 30) Riha, S.C., Klahr, B.M., Tyo, E.C., Seifert, S., Vajda S., Pellin, M.J., Hamann, T.W., Martinson, A.B.F.; “Atomic Layer Deposition of a Sub-monolayer Catalyst for the Enhanced Photoelectrochemical Performance of Water Oxidation with Hematite.” *ACS Nano*, **2013**, 7 (3), 2396 – 2405
- \* *thomson reuters highly cited paper (top 1%)*
- 29) Xie, Y., Hamann, T.W.; “Fast Low Spin Cobalt Complex Redox Shuttles for Dye-Sensitized Solar Cells.” *Journal of Physical Chemistry Letters*, **2013**, 4, 328 – 332
- 28) Zandi, O., Klahr, B.M., Hamann, T.W.; “Highly Photoactive Ti-doped  $\alpha$ -Fe<sub>2</sub>O<sub>3</sub> Thin Film Electrodes; Resurrection of the Dead Layer.” *Energy and Environmental Science* **2013**, 6, 634 – 642
- \* *thomson reuters highly cited paper (top 1%)*
- 27) Ondersma, J.W.; Hamann, T.W.; “Recombination and Redox Couples in Dye-Sensitized Solar Cells.” *Coordination Chemistry Reviews* **2013**, 257, 1533 – 1543
- 26) Ondersma, J.W.; Hamann, T.W.; “Conduction Band Energy Determination by Variable Temperature Spectroelectrochemistry.” *Energy and Environmental Science* **2012**, 5 (11), 9476 – 9480
- 25) Klahr, B.M., Gimenez S., Fabregat-Santiago, F., Bisquert, J., Hamann, T.W.; “Photoelectrochemical and Impedance Spectroscopic Investigation of Water Oxidation with “Co-Pi” coated Hematite Electrodes.” *Journal of the American Chemical Society* **2012**, 134 (40), 16693 – 16700
- \* *thomson reuters highly cited paper (top 1%)*
- 24) Hamann, T.W.; “Splitting Water with Rust: Hematite Photoelectrochemistry.” *Dalton Transactions*, **2012**, 41, 7830 – 7834
- 23) Klahr, B.M., Gimenez S., Fabregat-Santiago, F., Bisquert, J., Hamann, T.W.; “Electrochemical and Photoelectrochemical Investigation of Water Oxidation with Hematite Electrodes.” *Energy and Environmental Science* **2012**, 5 (6), 7626 – 7636
- \* *thomson reuters highly cited paper (top 1%)*
- 22) Klahr, B.M., Gimenez S., Fabregat-Santiago, F., Hamann, T.W., Bisquert, J.; “Water oxidation at hematite photoelectrodes: the role of surface states.” *Journal of the American Chemical Society* **2012**, 134 (9), 4294 – 4302

**\* thomson reuters highly cited paper (top 1%)**

- 21) Hamann, T.W.; “The End of Iodide? Cobalt Complex Redox Shuttles in DSSCs.” *Dalton Transactions*, **2012**, 41 (11), 3111 – 3115
  - 20) Ondersma, J.W.; Hamann, T.W.; “Spatially-Resolved Sources of Dark Current in DSSCs.” *Langmuir* **2011**, 27, 13361 – 13366
  - 19) Klahr, B.M.; Hamann, T.W.; “Voltage Dependent Photocurrent of Thin Film Hematite Electrodes.” *Applied Physics Letters* **2011**, 99, 063508
  - 18) Ondersma, J.W.; Hamann, T.W.; “Measurements and Modeling of Recombination from Nanoparticle TiO<sub>2</sub> Electrodes.” *Journal of the American Chemical Society* **2011**, 133, 8264 – 8271
  - 17) Klahr, B.M.; Hamann, T.W.; “Current and Voltage Limiting Processes in Thin Film Hematite Electrodes.” *Journal of Physical Chemistry C* **2011**, 115, 8393 – 8399
  - 16) Klahr, B.M.; Martinson, A.B.F.; Hamann, T.W.; “Photoelectrochemistry of Ultra Thin Film Iron Oxide Electrodes Prepared by Atomic Layer Deposition.” *Langmuir* **2011**, 27 (1), 461 – 468
  - 15) Hamann, T.W.; Ondersma, J.W.; “Redox Shuttles in Dye-Sensitized Solar Cells.” *Energy and Environmental Science*, **2011**, 4, 370 – 381
- \* thomson reuters highly cited paper (top 1%)**
- 14) Ondersma, J.W.; Hamann, T.W.; “Impedance Investigation of Dye-Sensitized Solar Cells Employing Outer-Sphere Redox Shuttles.” *Journal of Physical Chemistry C* **2010**, 114, 638 – 645
  - 13) Klahr, B.M.; Hamann, T.W.; “Performance Enhancement and Limitations of Cobalt Dipyriddy Redox Shuttles in Dye-Sensitized Solar Cells.” *Journal of Physical Chemistry C* **2009**, 113, 14040 – 14045

**Postdoctoral Work**

- 12) Hamann, T.W.; Farha O.K.; M.; Hupp, J.T.; “Outer-sphere Redox Couples as Shuttles in Dye-Sensitized Solar Cells. Performance Enhancement Based on Photoelectrode Modification via Atomic Layer Deposition.” *Journal of Physical Chemistry C* **2008**, 112, 19756 – 19764
  - 11) Hamann, T.W.; Jensen, R.A.; Martinson, A.B.F.; Van Ryswyk H.; Hupp, J.T.; “Advancing beyond current generation dye-sensitized solar cells.” *Energy and Environmental Science* **2008**, 1, 66 – 78
- \* thomson reuters highly cited paper (top 1%)**
- 10) Hamann, T.W.; Martinson, A.B.F.; Pellin, M.; Hupp, J.T.; “Novel TiO<sub>2</sub> Nanostructured Photoanodes in Dye-Sensitized Solar Cells.” *Journal of Physical Chemistry C* **2008**, 112, 10303 – 10307
  - 9) Hamann, T.W.; Martinson, A.B.F.; Pellin, M.; Hupp, J.T.; “Aerogel templated ZnO Dye-Sensitized Solar Cells.” *Advanced Materials* **2008**, 20, 1560 – 1564

- 8) Martinson, A.B.F.; Hamann, T.W.; Pellin, M.; Hupp, J.T.; “Alternative Photoanode Architectures for Dye-Sensitized Solar Cells.” *Chemistry – A European Journal* 2008, 14, 4458 – 4467

\* *thomson reuters highly cited paper (top 1%)*

### **Graduate Work**

- 7) Hamann, T.W.; Brunshwig, B. S.; Lewis, N. S.; “A Comparison of the Self-Exchange and Interfacial Charge-Transfer Rate Constants for Methyl vs. t-Butyl Substituted Os(III) Polypyridyl Complexes.” *Journal of Physical Chemistry B* 2006, 110, 25514 – 2552
- 6) Hamann, T.W.; Lewis, N. S.; “Control of the Stability, Electron-Transfer Kinetics, and pH-Dependent Energetics of Si/H<sub>2</sub>O Interfaces Through Methyl Termination of Si(111) Surfaces” *Journal of Physical Chemistry B* 2006, 110, 22291 – 22294
- 5) Royea, W.J.; Hamann, T.W.; Brunshwig, B. S.; Lewis, N. S.; “A Comparison Between Interfacial Electron-Transfer Rate Constants at Metallic and Graphite Electrodes.” *Journal of Physical Chemistry B* 2006, 110, 19433 – 19442
- 4) Hamann, T.W.; Gstrein, F.; Brunshwig, B. S.; Lewis, N. S.; “Measurement of the Driving Force Dependence of Interfacial Charge-Transfer Rate Constants in Response to pH Changes at n-ZnO/H<sub>2</sub>O Interface.” *Chemical Physics* 2006, 326, 13 – 26
- 3) Hamann, T.W.; Srivatsan, N.; Van Willigen, H.; “Time-Resolved EPR Study of the Photophysics and Photochemistry of 1-(3-(Methoxycarbonyl)Propyl)-1-Phenyl[6.6]C<sub>61</sub>” *Journal of Physical Chemistry A* 2005, 109, 11665 – 11672
- 2) Hamann, T.W.; Gstrein, F.; Brunshwig, B. S.; Lewis, N. S.; “Measurement of the Dependence of Interfacial Charge-Transfer Rate Constants on the Reorganization Energy of Redox Species at n-ZnO/H<sub>2</sub>O Interfaces.” *Journal of the American Chemical Society* 2005, 127, 13949 – 13954
- 1) Hamann, T.W.; Gstrein, F.; Brunshwig, B. S.; Lewis, N. S.; “Measurement of the Free Energy Dependence of Interfacial Charge-Transfer Rate Constants Using ZnO/H<sub>2</sub>O Semiconductor/Liquid Contacts.” *Journal of the American Chemical Society* 2005, 127, 7815 – 7824

### **PRESENTATIONS AT SCHOLARLY MEETINGS**

#### ***Invited Presentations:***

Electrochemical Society, Dallas, TX	May 29, 2019
GRC: Inorganic Reaction Mechanisms, Galveston, TX	March 2019
Electrochemical Society, Canadian Section, Montreal Canada * <i>Keynote lecture</i>	November 10, 2018
Int’l Symposium on Solar Fuels and Solar Cells, Dalian China * <i>Keynote lecture</i>	October 19, 2018
Electrochemical Society, Seattle, WA	May 14, 2018

American Chemical Society, New Orleans, LA	April 19, 2018
DOE Solar Photochemistry Research Conference, Annapolis, MD	June 5, 2017
Electrochemical Society, New Orleans, LA	May 29, 2017
Materials Research Society, Boston, MA	December 2, 2016
Materials Research Society, Boston, MA	November 30, 2016
Electrochemical Society, San Diego, CA	May 2016
Materials Research Society, Phoenix, AZ	March 2016
GRC: Solar Fuels, Il Ciocco, Italy	February 2016
Sustainably Lighting the World, East Lansing, MI	October 2015
PittCon, New Orleans, LA	March 2015
<i>* Royce W. Murray Young Investigator Award Lecture</i>	
Kavli Frontiers of Science, Jerusalem, Israel	February 2015
<i>*one of 13 American Scientists chosen by the US Academy of Science</i>	
Materials for Tomorrow, Gothenburg, Sweden	November 2014
Dreyfus Teacher-Scholar Symposium, New York, NY	October 2014
American Vacuum Society, East Lansing, MI	August 2014
DOE Solar Photochemistry Research Conference, Annapolis, MD	June 2014
American Chemical Society, Dallas, TX	March 2014
PittCon, Chicago, IL	March 2014
Materials Challenges in Alternative & Renewable Energy	February 2014
GRC: Solar Fuels, Ventura, CA	January 2014
Transatlantic Frontiers of Chemistry, Kloster Seon, Germany	August 2013
<i>*one of 19 American Chemists chosen by ACS</i>	
nanoGe SolarFuels13, Granada Spain	June 2013
Materials Research Society, San Francisco, CA	April 2013
American Chemical Society, Philadelphia, PA	August 2012
<i>*Committee on Science's Young Investigator Forum</i>	
Canadian Chemistry Conference, Calgary, Canada	May 2012
nanoGe SolarFuels12, Mallorca Spain	March 2012
Smart Surfaces, Dublin Ireland	March 2012
<i>*keynote lecture</i>	
American Chemical Society, Anaheim, CA	March 2011
Pacificchem, Honolulu, HI	December 2010



American Chemical Society, Boston, MA	August 2010
GRC: Electron Donor-Acceptor Interactions, Newport, RI	August 2010
Complex Materials for Energy Applications, East Lansing, MI	June 2010
PittCon, Orlando, FL	March 2010
CeRMACS, Cleveland, OH	May 2009
American Chemical Society, Salt Lake City, UT	March 2009
Electrochemical Society- Detroit Section, Detroit, MI	December 2008

***Attended/Presentation:***

DOE Solar Photochemistry, Gaithersburg, MD	June 2019
DOE Solar Photochemistry, Gaithersburg, MD	June 2018
GRC: Solar Fuels, Ventura, CA	January 2018
DOE Solar Photochemistry, Gaithersburg, MD	June 2016
DOE Solar Photochemistry, Gaithersburg, MD	June 2015
International Symposium on the Photochemistry and Photophysics of Coordination Compounds, ISPPCC, Traverse City, MI	July 2013
DOE Solar Photochemistry, Annapolis, MD	June 2013
American Chemical Society National Meeting, New Orleans, LA	April 2013
DOE Solar Photochemistry, Annapolis, MD	June 2012
GRC: Solar Fuels, Il Ciocco, Italy <i>*poster talk</i>	May 2012
Hybrid and Organic Photovoltaics; Upsalla, Sweden <i>*session chair</i>	May 2012
Electrochemical Society, Boston, MA	October 2011
Hybrid and Organic Photovoltaics; Valencia, Spain	May 2011
European- Materials Research Society; Nice, France	May 2011
Materials Research Society, San Francisco, CA	April 2011
GRC: Solar Fuels, Ventura, CA	February 2011
Zing, Solar Fuels, Cancun Mexico	December 2010
CERMACS, Dayton, OH	June, 2010
Materials Research Society, Boston, MA	December 2009
Electrochemical Society, Vienna, Austria	October 2009
Electrochemical Society, Honolulu, HI	October 2008

American Chemical Society National Meeting, Boston, MA	August 2007
Fifteenth Western Photosynthesis Conference, Pacific Grove, CA	January 2006
Electrochemical Society, Honolulu, HI	October 2004
American Chemical Society National Meeting, Anaheim, CA	March 2004
American Chemical Society National Meeting, New York, NY	March 2004
Organometallics Seminar, California Institute of Technology	June 2003

### **INVITED SEMINARS**

Indiana University–Purdue University Indianapolis	October 2016
MIT / Harvard Joint Seminar	September 2016
University of Wisconsin	September 2016
Boston College	September 2016
Yale University	November 2015
University of California, Irvine	November 2015
Purdue University	April 2014
CORE-CM, Michigan State University	April 2013
Bowling Green University	March 2013
University of Colorado	February 2013
Colorado State University	February 2013
University of Wyoming	February 2013
Northwestern University	December 2012
Michigan State University	November 2012
Kalamazoo College	October 2012
University of Connecticut	October 2012
University of Southern California	October 2012
California Institute of Technology	October 2012
University of California Berkeley	September 2012
University of Washington	May 2012
Ohio State University	April 2012
Grand Valley State University	October 2011
Adrian College	October 2011
Northern Illinois University	March 2011

Argonne National Laboratory, Material Science Division	October 2010
University of New Orleans	April 2010
Hillsdale College	October 2009
Oakland University	March 2009
University of California Berkeley	January 2008
Brown University	January 2008
University of California Davis	January 2008
University of California Los Angeles	January 2008
Washington University	January 2008
Rice University	December 2007
Rutgers University	December 2007
Michigan State University	December 2007

## CURRENT FUNDING

- Title:** “Monolithically Integrated Thin-Film/Silicon Tandem Photoelectrodes for High Efficiency and Stable Photoelectrochemical Water Splitting”

**Agency:** Department of Energy, EERE Fuel Cell Technologies

**Budget:** \$236,250 (co-PI Hamann’s share of \$1,000,000 total award)

**Project period:** 09/01/2017 – 08/31/2020

*\*co-PI*
- Title:** “Multi-Component Investigation of Electron-Transfer Processes for Next-Generation Dye Sensitized Solar Cells”

**Agency:** Department of Energy, Office of Science, Basic Energy Sciences

**Budget:** \$465,000

**Project period:** 05/15/2017 – 05/14/2020
- Title:** “Investigation of Semiconductor Surfaces and Catalyst Interfaces for Water Oxidation with Solar Energy”

**Agency:** National Science Foundation, Chemical Catalysis

**Budget:** \$450,000

**Project period:** 07/01/2017 – 06/30/2020

<b>COURSES TAUGHT</b>		<i>SIRS scores from 0 (outstanding) to 5 (poor)</i>
<b>Fall 2008</b>	CEM 913	Semiconductor Photoelectrochemistry <i>no SIRS available</i>
<b>Fall 2009</b>	CEM 811	Inorganic Chemistry <i>mean overall SIRS score: 1.4</i>
	CEM 918	Inorganic Seminar
<b>Spring 2010</b>	CEM 918	Inorganic Seminar
<b>Fall 2010</b>	CEM 913	The Chemistry and Physics of Solar Energy Conversion <i>mean overall SIRS score: 0.65</i>
<b>Spring 2011</b>	CEM 913	Energy Sciences <i>mean overall SIRS score: 0.15</i>
<b>Fall 2011</b>	CEM 181H	General Chemistry, Honors <i>mean overall SIRS score: 1.5</i>
	CEM 918	Inorganic Seminar
<b>Spring 2012</b>	CEM 420	Independent Research
	CEM 918	Inorganic Seminar
<b>Fall 2012</b>	CEM 181H	General Chemistry, Honors <i>mean overall SIRS score: 1.2</i>
<b>Spring 2013</b>	CEM 913	The Chemistry and Physics of Solar Energy Conversion <i>mean overall SIRS score: 0.26</i>
<b>Fall 2013</b>	CEM 181H	General Chemistry, Honors <i>mean overall SIRS score: 0.9</i>
	CEM 400H	Honors Work
<b>Spring 2014</b>	CEM 999	Doctoral Dissertation Research
<b>Summer 2014</b>	CEM 999	Doctoral Dissertation Research
<b>Fall 2014</b>	CEM 181H	General Chemistry, Honors <i>mean overall SIRS score: 1.2</i>
	CEM 999	Doctoral Dissertation Research
<b>Spring 2015</b>	CEM 400H	Honors Work
	CEM 999	Doctoral Dissertation Research
<b>Summer 2015</b>	CEM 999	Doctoral Dissertation Research
<b>Fall 2015</b>	CEM 420	Independent Research
	CEM 913	Energy Conversion Processes in Inorganic Materials

	CEM 918	Inorganic Seminar
	CEM 999	Doctoral Dissertation Research
<b><i>Spring 2016</i></b>	CEM 311	Inorganic Chemistry <i>mean overall SIRS score: 2.4</i>
	CEM 918	Inorganic Seminar
	CEM 999	Doctoral Dissertation Research
<b><i>Summer 2016</i></b>	CEM 999	Doctoral Dissertation Research
<b><i>Fall 2016</i></b>	CEM 420	Independent Research
	CEM 918	Inorganic Seminar
	CEM 999	Doctoral Dissertation Research
<b><i>Spring 2017</i></b>	CEM 913	Energy Conversion Processes in Inorganic Materials <i>mean overall SIRS score: 0.5</i>
	CEM 918	Inorganic Seminar
	CEM 999	Doctoral Dissertation Research
<b><i>Fall 2017</i></b>	CEM 999	Doctoral Dissertation Research
<b><i>Spring 2018</i></b>	CEM 420	Independent Research
	CEM 812	Advanced Inorganic Chemistry II <i>mean overall SIRS score: 0.7</i>
	CEM 999	Doctoral Dissertation Research
<b><i>Spring 2019</i></b>	CEM 913	Energy Conversion Processes in Inorganic Materials <i>mean overall SIRS score:</i>
	CEM 999	Doctoral Dissertation Research

## **ADVISING**

### ***Current Graduate Students*** *Expected Graduation*

Yujue Wang	Spring 2019
Austin Raithel	Spring 2021
Parisa Shadabipour	Spring 2021
Eric Firestone	Spring 2023
Shane Jackowski	Spring 2023

### ***Former Graduate Students***

Jesse Ondersma	Ph.D. Fall 2012 Chemistry Team Leader at Intertek
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Ben Klahr	Ph.D. Spring 2013 Research Analyst, CNA Corporation
Kelley Young	Ph.D. Spring 2015 Teaching Professor at Notre Dame
Omid Zandi	Ph.D. Fall 2015 Research Scientist/Technology Developer at Tokyo Electron
Yuling Xie	Ph.D. Fall 2015 Senior Analytical Chemist, Avomeen
Daniel Little	Ph.D. Spring 2017 Associate Lecturer at University of Wisconsin, La Crosse
Dhritabrata Mandal	Ph.D. Summer 2017 Engineer at Intel
Yuan Gao	Ph.D. Summer 2017
Josh Baillargeon	Ph.D. Winter 2018 Chemist at Tokyo Electron
Hamed Najafabadi	Ph.D. Summer 2018
Faezeh Habib Zadeh	Ph.D. Spring 2019

***Postdoctoral Researchers***

Tea Yon Kim	03/2018 – present
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***Former Postdoctoral Researchers***

Geletu Qing	03/2017 – 03/2019
Qiong Wang	01/2016 – 08/2017 Postdoctoral Researcher,
Arianna Savini	04/2014 – 05/2016 Research Chemist, Leibniz Institute for Catalysis
Jorge Rossero	06/2014 – 05/2015 Process Engineer at Intel
Suraj Soman	12/2011 – 03/2014 DST-INSPIRE Faculty; CSIR-NIIST
Jason Thornton	10/2012 – 11/2013 Senior Chemist, Analytical Laboratory, ExxonMobil
Reenamole Georgekutty	3/15/2010 – 3/14/2012

***Undergraduate Students***

N/A

### ***Former Undergraduate Students***

Taylor Dean	Spring 2018
Emily Kochan	Spring 2017, Spring 2018
Abe Schon	Summer 2015, Summer 2016, Summer 2017
Dillon Edwards	Fall 2013 – Spring 2016
Travis Belknap	Summer 2016
Evan Lipsitze	Spring 2015
Brad Yurgens	Spring 2012 – Spring 2014
Stephanie Schmidt	Spring 2012 – Fall 2013
Christopher Tempas	Fall 2011 – Spring 2012
Trevor Steil	Spring 2011
Justin McComb	Spring 2010
Hali Sobczak	Spring 2009 – Fall 2010

### ***High School Students***

Anthony Shinn	6/1/2013 – 10/1/2014
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### ***Graduate Student Guidance Committees (students in other groups)***

Shruthi T. Kumar Raj, 2016 –	Lisa Janes, 2016 –
Karl Nielsen, 2016 –	Mona Ashtiani, 2016 –
Jonathan Yarranton, 2014 –	Michael Esch, 2015 –
Yang Chen, 2014 – 2016	Kelley Aldrich, 2014 –
Zhihui Liu, 2013 –	Xiaoran Zhang, 2013 –
Monica Carey, 2013 –	Shannon Kraemer, 2012 – 2016
Mersedeh Saniepay, 2012 – 2018	Chumpung Jiang, 2012 – 2017
Bin Guo, 2012 – 2016	Stephen Baumler, 2011 – 2017
Jeffrey Sayen, 2011 – 2014	Poulami Dutta, 2011 – 2016
Yan Zhu, 2010 –	Yueli Liu, 2010 – 2015
Behnaz Ghaffari, 2010 – 2017	Greg Spahlinger, 2009 – 2014
Jenny Miller, 2009 – 2018	Eileen Dixon, 2008 – 2015
Colin Blakely, 2009 – 2013	Shaun Bruno, 2009 – 2013
Yo-Yuan Cheng, 2008 –	Seth Hogg 2008 – 2013
Allison Brown, 2005 – 2013	Jon Kiel, 2005 – 2010

Hua Shao, 2004 – 2009

Lisa Harlow, 2006 – 2014

**UNIVERSITY  
SERVICE**

- Inorganic Seminar Coordinator; 2009–2010, 2011–2012, 2013–2017
- Chair of Faculty Search Committee, 2017–2018
- Director Core-CM; 2018–present
- Department Chair Search Committee member, 2019–present
- Served on NSF panel discussion with grant consultant Heidi Smith-Parker 2017
- Chair Advisory Committee; 2008–2010, 2013–2016
- Department Chair Search Committee member, 2015–2016
- Graduate Admissions Committee; 2009 – 2011, 2013 – 2017
- Reappointment and Promotions Committee; 2013
- University Appeals Board; 2009–present
- Education Policy Committee; 2011–2013
- Core-CM Seminar co-organizer; fall 2013, spring 2017
- Served on Office of the Vice President for Research and Graduate Studies SPG review panels; 2011
- University Planning Discussion, 2/2012
- MSU representative at Graduate School Forum at the Philadelphia Section of the ACS

**PROFESSIONAL  
OUTREACH**

- Organizer of 2014 International Conference on New Advances in Materials Research for Solar Fuels Production; Montreal, CA
- Organizer of 2020 International Conference on Solar Fuels; Barcelona, SP
- ACS Local Section Chair; 1/2010 – 1/2011
- Presented in a featured discussion panel, Michigan State University Science Festival, 4/19/2015
- NSF Reviewer and Panelist:
  - Small Business Innovation Research, Photovoltaics Phase I, 2010 & 2011 and Phase II, 2012
  - CHE – Macromolecular / Supramolecular / Nanochemistry, 2009
  - CHE – Chemical Synthesis, 2012
  - CBET – Electrocatalysis, 2014
  - CHE – Chemical Catalysis, 2014



CHE – Chemical Catalysis, 2015

- ARMY *ad hoc* reviewer of multiple proposals
- DOE BES *ad hoc* Reviewer, 2014 – present
- Invited Reviewer for the Israel Strategic Alternative Energy Foundation, 2012
- Invited Reviewer for Research Corporation, 2012 & 2013
- Invited Reviewer for Canada Research Chairs Program 2014
- Invited Reviewer for Polish National Science Center 2015
- Invited Reviewer for Kentucky Science & Engineering Foundation, 2016
- Guest editor for International Journal of Photoenergy; 2011
- Founder and host of the MSU Science Café
- Reviewer of >200 articles for multiple top-tier journals including Science, Nature, Nature Materials, Nature Chemistry JACS, Chemical Science, Energy and Environmental Science, ACS Nano, Nanoletters, etc.

**PROFESSIONAL  
MEMBERSHIPS**

American Chemical Society  
Materials Research Society  
Society for Electroanalytical Chemistry  
Electrochemical Society  
Inter-American Photochemical Society