CURRICULUM VITAE
January 2022

NAME LEONARD, KEVIN C.

EDUCATION

University of Wisconsin – Madison	Chemical Engineering & Mathematics	BS, 2003
University of Wisconsin – Madison	Materials Science	MS, 2011
University of Wisconsin – Madison	Materials Science (Advisor: Prof. Marc A. Anderson)	PhD, 2011
The University of Texas at Austin	Center for Electrochemistry (Advisor: Prof. Allen J. Bard)	Post-Doc, 2011-13

EMPLOYMENT HISTORY

2019 - present	Associate Professor, Chemical & Petroleum Engineering, University of Kansas
2013 – 2019	Assistant Professor, Chemical & Petroleum Engineering, University of Kansas
2012 – 2013	Oronzio & Niccolò De Nora Postdoctoral Fellow, The University of Texas at Austin
2011 – 2012	Postdoctoral Fellow, The University of Texas at Austin
2005 – 2011	Graduate Research Assistant, University of Wisconsin - Madison
2004 – 2005	ELP (Engineering Leadership Program) Engineer, National Instruments, Austin, TX

KU TEACHING RECORD

A. List of Courses Taught

Course Number & Title	Sem/Year	# Enrolled	%Taught
C&PE 722 Kinetics and Catalysis	Spring 2014	18	100
C&PE 722 Kinetics and Catalysis	Spring 2015	7	100
C&PE 524 Kinetics & Reactor Design	Spring 2015	68	100
C&PE 722 Kinetics and Catalysis	Spring 2016	14	100
C&PE 524 Kinetics & Reactor Design	Spring 2016	99	100
C&PE 701 Methods of CPE Calculations	Fall 2016	21	100
C&PE 800 Graduate Seminar	Fall 2016	39	100
C&PE 524 Kinetics and Reactor Design	Spring 2017	102	100
C&PE 701 Methods of CPE Calculations	Fall 2017	14	100
C&PE 524 Kinetics and Reactor Design	Spring 2018	87	100
C&PE 800 Graduate Seminar	Spring 2018	43	100
C&PE 615 Process Dynamics& Control	Fall 2018	89	100
C&PE 524 Kinetics and Reactor Design	Spring 2019	91	100
C&PE 615 Process Dynamics& Control	Fall 2019	89	100
C&PE 715 Data Science in Catalysis	Spring 2020	9	100
C&PE 615 Process Dynamics& Control	Fall 2020	63	100
C&PE 715 Data Science in Catalysis	Spring 2021	19	100
C&PE 615 Process Dynamics& Control	Fall 2021	63	100
C&PE 715 Data Science in Catalysis	Spring 2022	21	100

B. Undergraduate Advising Record

Undergraduate Academic Advisees (79 Total Undergraduate Advisees)

Undergraduate Research Advisees (47 Total Undergraduate Research Advisees)

C. Graduate and Postgraduate Advising Record

Committee Chair: Doctoral

1. Dr. Joe Barforoush (**Graduated Summer 2018**)
2. Charles Shaughnessy (**Graduated Spring 2019**)
3. Dylan Jantz (**Graduated Spring 2020**)
4. Matt Stalcup (Fall 2018, Current)
5. Andrew Jenny (Fall 2020, Fall 2021)
6. Bri Farris (Fall 2020, Current)
7. Darik Rosser (Spring 2022, Current)
8. Abdallah Bahdad (Spring 2022, Current)

Committee Chair: Masters

1. Tim McDonald (**Graduated Spring 2015**)
2. Tess Seuferling (**Graduated Summer 2019**)
3. Jane Wang (Fall 2020, Current)
4. Dinu Rajapakse (Fall 2020, Current)

D. Honors and Awards for Teaching

2020 John E. Sharp and Winifred E. Sharp Teaching Professorship
2019 Raymond Oenbring Teaching Award for Excellence in Chemical Engineering Education
2017 Don Green Faculty Fellowship for Teaching Excellence (2017-2019)
2015 Raymond Oenbring Teaching Award for Excellence in Chemical Engineering Education
2014 Kansas EPSCoR Education and Diversity Award

RESEARCH RECORD

A. Research Publications and/or Creative Works

Major Publications or Creative Works

Peer Reviewed Journals (Total Citations: 1149, h-index: 18 – Source: Google Scholar, Jan 31 2022)

* Corresponding Author; † Graduate Advisee; ‡ Undergraduate Advisee

33. Seuferling †, Tess E., Larson, T.R., Barforoush †, J.M., **Leonard*, K.C.** "Carbonate-derived multi-metal catalysts for electrochemical water splitting at high current densities." **ACS Sustainable Chem. Eng.** Vol 9, Issue 49, pp. 16678-16686 **2021**. (*Impact Factor*: **8.2**)
Supplemental Cover Feature Article

32. Hasan, Faruque M., Rossi, L.M., Debecker, D.P., **Leonard, K.C**., Li, Z., Makhubela, B.C.E., Zhao, C., Kleij, A. "Can CO2 and Renewable Carbon Be Primary Resources for Sustainable Fuels and Chemicals?" **ACS Sustainable Chem. Eng**. Vol 9, Issue 37, pp. 12427-12430 **2021**. (*Impact Factor*: **8.2**: *Citations*: 1)

31. Stalcup, M.A.†; Nilles, C. K..; Lee, H-J.; Subramaniam, B.* Blakemore, J* and **Leonard, K.C.***, "Organic Electrosynthesis in CO2-eXpanded Electrolytes: Enabling Selective Acetophenone Carboxylation to Atrolatic Acid" **ACS Sustainable Chemistry and Engineering** Vol 9, Issue 31, pp. 10431-10436 **2021** (*Impact Factor*: **8.2**) **Supplemental Cover Feature Article**

30. Jantz, Dylan T. ,† Ryan J. Balla, Siao-Han Huang, Niraja Kurapati, Shigeru Amemiya*, and **Kevin C. Leonard.*** "Simultaneous Intelligent Imaging of Nanoscale Reactivity and Topography by Scanning Electrochemical Microscopy." **Analytical Chemistry** Vol 93, Issue 25, pp. 8906-8914 **2021**. (*Impact Factor*: **7.0**, *Citations*: 1)

29. **Leonard, K.C.***, Faruque Hasan, Helen F. Sneddon, and Fengqi You. "Can Artificial Intelligence and Machine Learning Be Used to Accelerate Sustainable Chemistry and Engineering?." **ACS Sustainable Chemistry & Engineering** Vol. 9, Issue 18, pp. 6126-6129 **2021** (*Impact Factor*: **8.2**, *Citations*: 3)

28. Jantz, D.† Seuferling, T.†; and **Leonard, K.C.*** "Numerical Deconvolution of Surface Interrogation Scanning Electrochemical Microscopy" **ChemElectroChem** Vol 7, Issue 24, pp. 4863-4872 **2020** (*Impact Factor*: **4.6**, *Citations*: 2) **Front Cover Feature Article**

27. Sconyers, D.; Shaughnessy, C.I.† Lee, H-J.; Subramaniam, B.* **Leonard, K.C.*** and Blakemore, J* "Enhancing Molecular Electrocatalysis of CO_2 Reduction with Pressure-Tunable CO_2-Expanded Electrolytes" **ChemSusChem** Vol 13, Issue 23, pp. 6338-6345 **2020** (*Impact Factor*: **8.9**, *Citations*: 6) **Cover Feature Article**

26. Shaughnessy, C.I.†; Sconyers, D.; Kerr, T.; Lee, H-J.; Subramaniam, B.* Blakemore, J* and **Leonard, K.C.***, "Insights into Pressure Tunable Reaction Rates for Electrochemical Reduction of CO_2 in Organic Electrolytes" **Green Chemistry** Vol. 22, pp. 2434 - 2442 **2020** (*Impact Factor*: **10.2**, *Citations*: 10) **Back Cover Feature Article**

25. Balla, R.; Jantz, D.†, Kurapati, N; Chen, R.; **Leonard, K.C.***, and Amemiya, S.* "Nanoscale Intelligent Imaging Based on Real-Time Analysis of Approach Curve by Scanning Electrochemical Microscopy" **Analytical Chemistry** Vol. 91, Issue 15, pp. 10227-10235 **2019** (*Impact Factor*: **7.0**, *Citations*: 3)

24. Shaughnessy, C.I.†; Sconyers, D.; Kerr, T.; Lee, H-J.; Subramaniam, B.* **Leonard, K.C.***, and Blakemore, J..* "Intensified Electrocatalytic CO_2 Conversion in Pressure-Tunable CO_2-Expanded Electrolytes" **ChemSusChem** Vol. 12, Issue 16, pp. 3761-3768 **2019** (*Impact Factor*: **8.9**, *Citations*: 12) **Cover Feature Article**

23. Pavithra, P.; Balla, R.; Jantz, D.†, Kurapati, N; Gramm, E.; **Leonard, K.C.**, and Amemiya, S.* "Probing High Permeability of Nuclear Pore Complexes by Scanning Electrochemical Microscopy: Ca^{2+} Effects on Transport Barriers" **Analytical Chemistry** Vol. 91, Issue 4 **2019** (*Impact Factor*: **7.0**, *Citations: 7*)

22. Zhao, Z., **Leonard, K.C.**, and Boika, A. "Hot-Tip Scanning Electrochemical Microscopy: Theory and Experiments Under Positive and Negative Feedback Conditions." **Analytical Chemistry** Vol. 91, Issue 4, pp. 2970-2977 **2019** (*Impact Factor*: 7.**0**, *Citations:* 8) **Front Cover Article.**

21. Jantz, D.† and **Leonard, K.C.*** "Characterizing Electrocatalysts with Scanning Electrochemical Microscopy" **ACS Industrial & Chemistry Engineering Research** Vol. 57, Issue 22, pp. 7431-7440 **2018**. (*Impact Factor*: **3.7**, *Citations:* 12) **Influential Researcher Special Issue.**

20. Barforoush, J.M.†, Seuferling, T.†; Jantz, D.†; Song, K.‡; and **Leonard, K.C.*** "Insights into the Active Electrocatalytic Areas of Layered Double Hydroxide and Amorphous Nickel–Iron Oxide Oxygen Evolution Electrocatalysts" **ACS Applied Energy Materials** Vol. 1 Issue 4, pp 1415–1423, **2018**. (*Impact Factor:* **6.0***, Citations:* 16*)*

19. Shaughnessy, C.I†, Jantz, D.† and **Leonard, K.C.*** "Selective Electrochemical CO_2 Reduction to CO Using In-Situ Reduced In_2O_3 Nanocatalysts" **Journal of Materials Chemistry A** Vol. 5, pp. 22743-22749, **2017.** (*Impact Factor*: **12.7,** *Citations:* 29)

18. Barforoush, J.M.†, Jantz, D.† Seuferling, T.‡; Song, K.‡; Cummings, L.C.‡ and **Leonard, K.C.*** "Microwave Assisted Synthesis of Nanoamorphous ($Ni_{0.8}$,$Fe_{0.2}$) Oxide Oxygen-Evolving Electrocatalyst Containing Only "Fast" Sites." **Journal of Materials Chemistry A** Vol. 5, pp 11661 - 11670, **2017**. (*Impact Factor*: **12.7,** *Citations:* 26) **Emerging Investigator Special Issue**

17. Kim, J.; Renault, C.; Nioradze, N. Arroyo-Curras, N.; **Leonard, K.C.*** and Bard, A.J.* "Nanometer Scale Scanning Electrochemical Microscopy Instrumentation." **Analytical Chemistry** Vol. 88, Issue 20, pp 10284–10289, **2016**. (*Impact Factor*: **7.0**, *Citations:* 36)

16. Kim, J.; Renault, C.; Nioradze, N. Arroyo-Curras, N.; **Leonard, K.C.** and Bard, A.J.* "Electrocatalytic Activity of Individual Pt Nanoparticles Studied by Nanoscale Scanning Electrochemical Microscopy." **Journal of The American Chemical Society** Vol. 138, Issue 27, pp 8560–8568, **2016**. (*Impact Factor*: **15.4**, *Citations:* 105)

15. McDonald, T.D.†; Beyer, C.‡; DeLee, A.M.‡; Atchison, E., Widrig, D.‡, Hutchens, B.‡ and **Leonard, K.C.*** Rapid characterization of multi-metallic electrocatalysts for the water splitting reactions utilizing printed microelectrodes on a chip, **Journal of the Electrochemical Society** Vol. 163, Issue 5, pp H359-H366, **2016**. *(Impact Factor:* **4.3***, Citations:* 14*)***.**

14. Barforoush, J.M.†; McDonald, T.D.†; Desai, T.‡; Widrig, D.‡; Bayer, C.‡; Brown, M. K.‡; Cummings, L.C.‡ and **Leonard, K.C.*** Intelligent Scanning Electrochemical Microscopy Tip and Substrate Control Utilizing Fuzzy Logic, **Electrochimica Acta** Vol. 190, pp.713-719, **2016**. *(Impact Factor:* **6.9***, Citations:* 23*)*

13. Jaison, D.; Barforoush, J.M.†; Qiao, Q.; Zhu, Y.; Ren, S.* and **Leonard, K.C.*** "Low-Dimensional Hyperthin FeS_2 Nanostructures for Efficient and Stable Hydrogen Evolution Electrocatalysis." **ACS Catalysis** Vol. 5, pp. 6653 – 6657, **2015**. (*Impact Factor*. **13.1***, Citations:* 123*)*

12. **Leonard, K.C**. and Bard, A.J.* The Study of Multireactional Electrochemical Interfaces Via a Tip Generation/Substrate Collection Mode of Scanning Electrochemical Microscopy: The Hydrogen Evolution Reaction for Mn in Acidic Solution, **The Journal of the American Chemical Society**, Vol. 135, Issue 42, pp. 15890-15896, **2013**. (*Impact Factor*: **15.4**, *Citations:* 37)

11. **Leonard, K.C.** and Bard, A.J.* Pattern Recognition Correlating Materials Properties of the Elements to Their Kinetics for the Hydrogen Evolution Reaction, **The Journal of the American Chemical Society**, Vol. 135, Issue 42, pp. 15885-15889, **2013**. (*Impact Factor*: **15.4**, *Citations:* 33)

10. **Leonard, K.C.**; Nam, K.M.; Lee, H.C.; Soon, H.K.; Park, H.S. and Bard, A.J.* $ZnWO_4/WO_3$ Composite for Improving Photoelectrochemical Water Oxidation, **The Journal of Physical Chemistry C**, Vol. 117, pp. 15901-15910, **2013**. (*Impact Factor*: **4.1**, *Citations:* 117)

9. Nam, K.M.; Park, H.S.; Lee, H.C.; Meekins, B.H.; **Leonard K.C.** and Bard, A.J.* Compositional Screening of the Pb-Bi-Mo-O System. Spontaneous Formation of a Composite of p-$PbMoO_4$ and n-Bi_2O_3 with Improved Photoelectrochemical Efficiency and Stability, **The Journal of Physical Chemistry Letters**, Vol. 4, pp. 2707-2710, **2013**. (*Impact Factor*: **6.4**, *Citations:* 35)

8. Park, H.S.; **Leonard, K.C**. and Bard, A.J.* Surface Interrogation Scanning Electrochemical Microscopy (SI-SECM) of Photoelectrochemistry at a W/Mo-$BiVO_4$ Semiconductor Electrode – Quantification of Hydroxyl Radicals During Water Oxidation, **The Journal of Physical Chemistry C**, Vol. 117, Issue 23, pp. 12093-12102, **2013**. (*Impact Factor*: **4.1**, *Citations:* 91)

7. Park, H.S.; Lee, H.C.; **Leonard, K.C.**; Liu, G. and Bard, A.J.* Unbiased Photoelectrochemical Water Splitting in Z-Scheme Device Using W/Mo-doped $BiVO_4$ and $Zn_xCd_{1-x}Se$, **ChemPhysChem**, Vol 14, Issue 10, pp. 2277-2287, **2013**. (*Impact Factor*: **3.1**, *Citations:* 57)

6. Najafpour, M.M*; **Leonard, K.C.**; Fan, F.F.; Tabrizi, M.A.; Bard, A.J.*; King'ondu, C.K; Suib, S.L.; Haghighi, B.; Allakhverdiev, S.A. Nano-size Layered Manganese–Calcium Oxide as an Efficient and Biomimetic Catalyst for Water Oxidation Under Acidic Conditions: Comparable to Platinum, **Dalton Transactions**, Vol. 42, Issue 14, pp. 5085-5091, **2013**. (*Impact Factor*: **4.4**, *Citations:* 42)

5. **Leonard, K.C.***; Tejedor-Anderson, M.I. and Anderson, M.A. Nanoporous Oxide Coatings on Stainless Steel to Enable Water Splitting and Reduce the Hydrogen Evolution Overpotential, **International Journal of Hydrogen Energy**, Vol. 37, Issue 24, pp. 18654-18660, **2012**. (*Impact Factor*: **5.8***, Citations:* 19)

4. Chang, J.; **Leonard, K.C.**; Cho, S.K. and Bard, A.J.* Examining Ultramicroelectrodes for Scanning Electrochemical Microscopy by White Light Vertical Scanning Interferometry and Filling Recessed Tips by Electrodeposition of Gold, **Analytical Chemistry**, Vol. 84, Issue 11, pp. 5159-5163, **2012**. (*Impact Factor*: **7.0**, *Citations:* 16)

3. **Leonard, K.C.***; Suyama, W.E. and Anderson, M.A. Evaluating the Electrochemical Capacitance of Surface-Charged Nanoparticle Oxide Coatings, **Langmuir,** Vol. 28, Issue 15, pp. 6476-6476, **2012**. (*Impact Factor*: **3.9**, *Citations:* 39)

2. **Leonard, K.C.***; Suyama, W.E. and Anderson, M.A. Improvement of Electrochemical Capacitor Electrodes using SiO_2 Nanoparticles, **Electrochimica Acta**, Vol. 56, Issue 27, pp. 10137-10144, **2011**. (*Impact Factor*: **6.9**, *Citations:* 28)

1. **Leonard, K.C.***; Genthe, J.R.; Sanfilippo, J.L.; Zeltner, W.A. and Anderson, M.A. Synthesis and Characterization of Asymmetric Electrochemical Capacitive Deionization Materials Using Nanoporous Silicon Dioxide and Magnesium Doped Aluminum Oxide, **Electrochimica Acta**, Vol. 54, Issue 22, pp. 5286-5291, **2009**. (*Impact Factor*: **6.9**, *Citations:* 120)

Book Chapters

4. **Leonard, K.C,** Seuferling T.E., Fan, FRF "Scanning Electrochemical Microscopic Imaging" in *Scanning Electrochemical Microscopy* Bard, A.J Eds. 2021

3. **Leonard, K.C** and Seuferling T.E. "Electrochemical Instrumentation" in *Encyclopedia of Electrochemistry* Bard, A.J Eds. 2021

2. Bard A.J.; Lee H.C.; **Leonard, K.C.**; Park, H.S. and Wang. S.J. "Rapid Screening of Photocatalysts for Studies of Compositional Effects on Performance" in *Photoelectrochemical Water Splitting: Materials, Processes and Architectures*, Lewerenz, H.J. and Peter, L.M., Eds. Royal Society of Chemistry: London, 2013.

1. Daugherty, M.D.; **Leonard, K.C.**; and Suyama, W.E. Power: Battery Boost, *Appliance Design*, March 1, 2009.

B. Scholarly Presentations

Major Presentations

Invited Talks

16. **Leonard, K.C.** "Internet of Catalysis - Harnessing Data for Catalysis Design" NRT Annual PI Meeting Jan 2021. (Invited Talk)

15. **Leonard, K.C.** "Electrocatalysis 101" Great Plains Catalysis Society Meeting April 2020. (Invited Talk)

14. **Leonard, K.C.** "Pressure Dependent Reaction Rates for Electrochemical CO_2 Reduction in CO_2-Expanded Electrolytes" 2019 Applied Energy Conference (MIT) May 2019. (Invited Talk)

13. **Leonard, K.C.** "Nanostructure-Controlled Activity of Electrocatalysts for the Solar Fuel Reactions." Materials Research Society Annual Spring Meeting 2018 (Invited Talk)

12. **Leonard, K.C**. "Characterizing Electrocatalysts with 'Nano' Gap Electrochemistry (Scanning Electrochemical Microscopy)." University of Pittsburgh Analytical Chemistry Seminar Series 2018 (Invited Talk).

11. **Leonard, K.C.** *Structure-Controlled Activity of Electrocatalysts for the Solar Fuel Reactions.* Oklahoma State University, Chemical Engineering Department Seminar, Nov. 2017 (Invited Talk).

10. **Leonard, K.C.** *Electrochemical Reduction of CO_2 Using Surface-Reduced In_2O_3 Nanocatalysts.* 2017 ACS Green Chemistry and Engineering, July 2017 (Invited Talk).

9. **Leonard, K.C.** *Layered-Hyperthin Electrocatalysts for the Water Splitting Reactions.* Kansas State University Chemical Engineering Department Seminar, Oct. 2016 (Invited Talk).

8. **Leonard, K.C.** *Solar Fuels: Using Chemistry to Store Solar Energy.* The University of Akron Chemistry Department Seminar, March 2016 (Invited Talk).

7. **Leonard, K.C.** *Solar Fuels: Using Chemistry to Store Solar Energy.* Kansas City AIChE Speaker Series, April 2015 (Invited Talk).
6. **Leonard, K.C.** *Methods for Discovering New Photocatalysts and Electrocatalysts for Solar Fuel Production*, University of Missouri Chemical Engineering Seminar, March 2014 (Invited Talk).
5. **Leonard, K.C.** *Novel Materials for Water Treatment Using Capacitive Deionization*, ASM Bergmann Seminar - Milwaukee Wisconsin, May 2011 (Invited Talk).
4. **Leonard, K.C.** and Anderson, M.A. *Overview of Capacitive Deionization Technologies*, Wisconsin/Israeli Commission Water Technology Meeting, April 2010 (Invited Talk).
3. **Leonard, K.C.** *Developing Ultracapacitors for Renewable Energy Applications*, University of Wisconsin Advanced Materials Industrial Consortium, April 2009 (Invited Talk).
2. Daugherty, M.D. and **Leonard, K.C.** *Ultracapacitors for Renewable Energy Storage*, EUCI Webinar, January 2009 (Invited Talk).
1. **Leonard, K.C.** *Energy and Water - Materials for Society's Two Most Important Resources*, Universidade Estadual Paulista - Araraquara, Brazil, April 2007 (Invited Talk).

Other Major Presentations

4. **Leonard, K.C.** "Scanning Electrochemical Microscopy Imaging" 2022 ARO Annual Meeting January 2022.
3. **Leonard, K.C.** "Electrocatalyst Characterization Utilizing Scanning Electrochemical Microscopy" 2021 ARO Annual Meeting April 2021.
2. **Leonard, K.C.** "Development of an Intelligent SECM Protocol for Investigating Reaction Intermediates and Designing Electrocatalysts" 2019 ARO Annual Meeting Dec 2019.
1. **Leonard, K.C.** *Nanoamorphous (Ni,Fe) Oxide Electrocatalysts for the OER.* 2016 AIChE Annual Meeting, Nov. 2016.

Minor Presentations

52. **Leonard, K.C.** "If I knew then what I know now" NSF NRT New PI Meeting. November. 2021.

51. **Leonard, K.C.** "What is Machine Learning" KU Engineering Undergraduate Honors Seminar. November. 2021.

50. Subramaniam, B. Allgeier, A. and **Leonard, K.C.** "Engineering the Future." University of Kansas CEBC Industrial Advisory Board Meeting Seminar. Oct. 2021

49. **Leonard, K.C.** "Data Extraction and Machine Learning of Experimental Catalysis Data." University of Kansas Chemical and Petroleum Engineering Department Seminar. Oct. 2021

48. **Leonard, K.C.** "Road to Entrepreneurship." University of Missouri Kauffman Foundation. March. 2021.

47. **Leonard, K.C.** "From Patents to Pivots: A journey into early stage start-up companies." KU Meet the Entrepreneur Lunch and Learn. Oct. 2020.

46. **Leonard, K.C.** "NRT- Internet of Catalysis" CEBC Annual IAB Meeting. April. 2020.

45. **Leonard, K.C.** "Electrochemistry in CO_2 Expanded Electrolytes". CEBC Annual IAB Meeting. April. 2019.

44. Shaughnessy, C. and **Leonard, K.C.** Enhancement of Electrocatalytic CO_2 Reduction using CO_2 Expanded Electrolytes (CXEs) AiChE National Meeting Nov. 2018.

43. **Leonard, K.C.** "Utilizing Scanning Electrochemical Microscopy to Reveal Insights into the Oxygen Evolution Reaction." ARO Chemistry Division Annual Meeting. Aug. 2018.

42. Shaughnessy, C.I, Kerr, T, Sconyers, D. Subramaniam, B., **Leonard, K.C.**, and Blakemore, J.D. "Enhanced Electrocatalytic CO_2 Conversion in Carbon Dioxide Expanded Electrolytes." Poster: 2018 Green Chemistry Gordon Research Conference. Aug. 2018.

41. **Leonard, K.C.** "Entrepreneurship and Innovation" KU Self Student Workshop, April 2018.

40. Blakemore, J.D. Shaughnessy, C.I, Kerr, T, Sconyers, D. Subramaniam, B., and **Leonard, K.C.**, "Carbon dioxide-expanded liquids as media for electrochemistry and catalysis." ACS National Meeting. March 2018.

39. Barforoush, J.M.; Jantz, D., Seuferling, T., Song, K. and **Leonard, K.C.** *Nanoamorphous (Ni,Fe) Oxide Electrocatalysts for the OER* Poster, IAB/SAB CEBC Meeting – University of Kansas, April 2018.

38. Kerr, T., Shaughnessy, C., Lee, H-S., Subramaniam, B., **Leonard, K.C** and Blakemore, J. *Electrochemical Carbon Dioxide Conversion in CO_2-Expanded Liquids (CXLs)* Poster, IAB/SAB CEBC Meeting – University of Kansas, April 2018.

37. Barforoush, J.M.; Jantz, D., Seuferling, T., Song, K. and **Leonard, K.C.** *Nanoamorphous (Ni,Fe) Oxide Electrocatalysts for the OER* Poster, IAB/SAB CEBC Meeting – University of Kansas, April 2018

36. Barforoush, J.M.; Jantz, D., Seuferling, T., Song, K. and **Leonard, K.C.** *Nanoamorphous Ni:Fe Oxide OER Electrocatalysts Containing Only "Fast" Sites* Poster, Electrochemisty Gordon Conference Jan 2018.

35. **Leonard, K.C.** "Nanostructure-Controlled Activity of Electrocatalysts for the Solar Fuel Reactions." KU ME Department Seminar (Nov. 2017)

34. **Leonard, K.C.** *Characterizing Electrocatalysts with Scanning Electrochemical Microscopy.* The University of Kansas Analytical Chemistry Seminar Series, Oct. 2017.

33. **Leonard, K.C.** *How To Convert CO2 Into Valuable Chemicals Using Renewable Energy Rock Chalk Talk"* The University of Kansas AIChE Student Seminar, April. 2017.

32. Jantz, D., Bahm, T, Wheeler, L. and **Leonard, K.C.** Deconvolution of Electrochemical CO2 Reduction and Hydrogen Evolution via Multi-Reactional Scanning Electrochemical Microscopy Poster, IAB/SAB CEBC Meeting – University of Kansas, April 2017

31. Barforoush, J.M.; Jantz, D., Seuferling, T., Song, K. and **Leonard, K.C.** *Nanoamorphous (Ni,Fe) Oxide Electrocatalysts for the OER* Poster, IAB/SAB CEBC Meeting – University of Kansas, April 2017.

30. Kerr, T., Shaughnessy, C., Lee, H-S., Subramaniam, B., **Leonard, K.C** and Blakemore, J. *Electrochemical Carbon Dioxide Conversion in CO_2-Expanded Liquids (CXLs)* Poster, IAB/SAB CEBC Meeting – University of Kansas, April 2017.

29. **Leonard, K.C.** *How To Convert CO_2 Into Valuable Chemicals Using Renewable Energy* KU AIChE Student Chapter Meeting March 2017.

28. Barforoush, J.M.; Jantz, D., Seuferling, T., Song, K. and **Leonard, K.C.** *Nanoamorphous (Ni,Fe) Oxide Electrocatalysts for the OER* Poster, CEC Workshop on Electrochemistry – The University of Texas,

February 2017.

27. **Leonard, K.C.** *On-Demand Hydrogen Production.* Whiteboard to 2 Boardroom Meeting, Kansas City, MO, Jan 2017.

26. Kerr, T., Shaughnessy, C., Lee, H-S., Subramaniam, B., **Leonard, K.C** and Blakemore, J. *Electrochemical Carbon Dioxide Conversion in CO2-Expanded Liquids (CXLs)* Poster, IAB/SAB CEBC Meeting – University of Kansas, Oct. 2016.

25. Barforoush, J.M.; Jantz, D. and **Leonard, K.C.** *Nanoamorphous (Ni,Fe) Oxide Electrocatalysts for the OER* Poster, IAB/SAB CEBC Meeting – University of Kansas, Oct. 2016.

24. **Leonard, K.C.** *Layered-Hyperthin Electrocatalysts for the Water Splitting Reactions.* IAB/SAB CEBC Meeting – University of Kansas, Oct. 2016.

23. Barforoush, J.M.; Jasion, D., Ren, S. and **Leonard, K.C.** *Low-Dimensional Hyperthin FeS_2 Nanostructures for Efficient and Stable Hydrogen Evolution Electrocatalysis*, Poster, CEC Workshop on Electrochemistry – The University of Texas, February 2016.

22. **Leonard, K.C.** *Solar Fuels: Using Chemistry to Store Solar Energy*, CPE 715 Guest Lecture, October 2015.

21. Barforoush, J.M.; Jasion, D., Ren, S. and **Leonard, K.C.** *Low-Dimensional Hyperthin FeS_2 Nanostructures for Efficient and Stable Hydrogen Evolution Electrocatalysis*, Poster, IAB/SAB CEBC Meeting – University of Kansas, October 2015.

20. Barforoush, J.M.; Jasion, D., Ren, S. and **Leonard, K.C.** *Hydrogen Evolution in Neutral Water with Iron Pyrite Nanoparticles*, Poster, IAB/SAB CEBC Meeting – University of Kansas, April 2015.

19. McDonald, T. and **Leonard. K.C.** *Application of a new rapid screening method for electrochemical characterization of NiMo hydrogen evolution catalysts*, SAB CEBC Meeting – University of Kansas, October 2014.

18. **Leonard, K.C.** *Electrocatalytic and Photoelectrocatalytic Materials Design and Characterization*, IAB/SAB CEBC Meeting - University of Kansas, April 2014.

17. **Leonard, K.C.** *Methods for Discovering New Photocatalysts and Electrocatalysts for Solar Fuel Production*, University of Kansas Chemical & Petroleum Engineering Seminar, March 2014.

16. **Leonard, K.C.** *Methods for Discovering New Photocatalysts and Electrocatalysts for Solar Fuel Production*, University of Kansas Applied Physics Seminar, February 2014.

15. **Leonard, K.C.** *Methods for Discovering New Photocatalysts and Electrocatalysts for Solar Fuel Production*, University of Kansas Chemistry DyMERS Colloquium, January 2014.

14. **Leonard, K.C.** and Bard, A.J. *Studies of Multireactional Electrochemical Interfaces by SECM*, 7th Workshop on Scanning Electrochemical Microscopy, February 2013.

13. **Leonard, K.C.** and Anderson, M.A. *Electrochemical Capacitors Using Novel Nanoporous Insulating Oxide Materials*, ISEE'Cap09, July 2009.

12. **Leonard, K.C.** *Ultracapacitors for Off-Grid Solar Energy Applications*, Wisconsin Renewable Energy Summit, March 2009.

11. **Leonard, K.C.** and Anderson, M.A. *Novel Materials for Water Treatment Using Capacitive Deionization*, Electrochemical Society Conference, October 2008.

10. **Leonard, K.C.** and Anderson, M.A. *Novel Nanoporous Insulating Oxide Materials for Electrochemical*

Capacitors, Electrochemical Society Conference, October 2008.

9. **Leonard, K.C.** and Anderson, M.A. *Asymmetric Porous Oxide Electrolyte Membrane Ultracapacitive Water Treatment*, International Society of Electrochemistry Conference, September 2008.
8. Anderson, M.A. and **Leonard, K.C**. *Novel Porous Oxide Electrolyte Membrane Electrochemical Capacitors*, Advanced World Capacitor Conference, July 2008.
7. **Leonard, K.C.** and Anderson, M.A. *Novel Materials for an Asymmetric Nanoporous Oxide Electrochemical Capacitive Deionization System*, Electrochemical Society Conference, October 2007.
6. **Leonard, K.C.** and Anderson, M.A. *Novel Nanoporous SiO_2 Materials for Electrochemical Capacitors*, Electrochemical Society Conference, October 2007.
5. **Leonard, K.C.** *Electrochemical Capacitor Utilizing Novel Nanoporous SiO_2*, NanoTX, October 2007.
4. **Leonard, K.C.** and Anderson, M.A. *Synthesis and Characterization of an Asymmetric Nanoporous Oxide Electrolyte Membrane Electrochemical Deionization System*, Electrochemical Society Conference, May 2007.
3. **Leonard, K.C.** and Anderson, M.A. *Synthesis and Characterization of Porous Oxide Electrolyte Membrane Electrochemical Capacitors Using SiO_2*, Electrochemical Society Conference, May 2007.
2. **Leonard, K.C.** and Anderson, M.A. *Synthesis and Characterization of High-Power Electrochemical Double Layer Capacitors Using Novel Nanoporous Materials*, Electrochemical Society Conference, October 2006.
1. **Leonard, K.C.** and Anderson, M.A. *Synthesis and Characterization of a Novel Nanoporous Asymmetric Electrochemical Deionization System*, Electrochemical Society Conference, October 2006.

C. Patents

Approved Patents

6. Patent #10,961,631: **Leonard, K.C.** Barforoush, J.M. Song, K. Seuferling, T. Microwave-Assisted Synthesis of Metal Oxyhydroxides (Issued 2021)

5. Patent # 10,457,566 Jasion, D.; Barforoush, J.M.; Ren, S.; **Leonard. K.C.** Low-Dimensional Hyperthin FeS2 Nanostructures for Efficient and Stable Hydrogen Evolution Electrocatalysis \ (Issued 2020)

4. Patent #10,196,746 **Leonard, K.C.** Barforoush, J.M. Song, K. Seuferling, T. Simple Microwave Assisted Synthesis of Metal Oxyhydroxides (Issued 2019)

3. Patent #9,365,939: Anderson, M.A., **Leonard, K.C.**, Nanoporous Materials for Reducing the Overpotential of Creating Hydrogen by Water Electrolysis (Issued 2016)

2. Patent #8,116,067: Anderson, M.A., **Leonard, K.C.**, Nanoporous Insulating Oxide Electrolyte Membrane Ultracapacitor, Button Cell, Stacked Cell and Coiled Cell and Methods of Manufacture and Use Thereof (Issued 2012).

1. Patent #8,216,445: Anderson, M.A., **Leonard, K.C.**, Nanoporous Insulating Oxide Deionization Device Having Electrolyte Membrane, and Method of Manufacture and Use Thereof (Issued 2012).

Submitted Patents

1. **Leonard, K.C.**, Blakemore, J., Subramaniam, B. Carbon Dioxide Conversion In Liquids Expanded By Carbon Dioxide US Patent App 17/255,059

E. Honors and Awards for Research

2021 ACS Sustainable Chemistry and Engineering Cover Feature (x2)
2020 ChemElectroChem Front Cover Feature
2020 ChemSusChem Front Cover Feature
2020 Green Chemistry Back Cover Feature
2019 ChemSusChem Front Cover
2019 KU Miller Scholar Award
2019 ACS Analytical Chemistry Front Cover
2018 ACS Industrial and Chemistry & Engineering Research Influential Researcher
2017 KU Miller Distinguished Service Award for Research
2017 Royal Society of Chemistry - Journal of Materials Chemistry A Emerging Investigator
2017 Royal Society of Chemistry - Journal of Materials Chemistry A "Hot Paper"
2017 Army Research Office Young Investigator Award (2017 - 2021)
2012 Oronzio and Niccolò De Nora Foundation Postdoctoral Fellowship in Applied Electrochemistry

SERVICE RECORD

A. Professional Service Outside the University

Editorial Position**:**

2021-present ACS Sustainable Chemistry and Engineering Early Career Advisory Board Member

Symposium Organization and Chair:

2019 CO_2 Industrial, Engineering and R&D Approaches Symposium Chair, American Institute of Chemical Engineers (AIChE) Annual Conference, Environmental Division, Fall 2019
2019 CO_2 Utilization - 2019 Applied Energy Conference MIT
2018 CO_2 Industrial, Engineering and R&D Approaches Symposium Chair, American Institute of Chemical Engineers (AIChE) Annual Conference, Environmental Division, Fall 2018
2018 Rational Designed Hierarchical Nanostructures for Photocatalytic Systems, Session Co-Chair, Materials Research Society Annual Meeting,
2015 Electrocatalysis & Photocatalysis Symposium Co-Organizer, American Chemical Society Conference Catalysis Division, Spring 2015

Journal Reviewer:

Advanced Functional Materials (*Impact Factor:* 18.1)
Advanced Science (*Impact Factor:* 16.8*)*
ACS Nano (*Impact Factor:* 15.8*)*
Journal of the American Chemical Society (*Impact Factor:* 15.4*)*

Angewandte Chemie (*Impact Factor:* 15.3)
Nature Communications (*Impact Factor:* 14.9*)*
Science Advances (*Impact Factor:* 14.4)
Small (*Impact Factor 13.3)*
ACS Catalysis (*Impact Factor:* 13.1*)*
Journal of Materials Chemistry A *(Impact Factor:* 12.7*)*
Green Chemistry (*Impact Factor: 10.2*)
Chemistry of Materials *(Impact Factor 9.8)*
ACS Applied Materials and Interfaces (*Impact Factor: 9.2)*
ChemSusChem (*Impact Factor:* 8.9*)*
ACS Sustainable Chemistry & Engineering (*Impact Factor:* 8.2*)*
Journal of Catalysis (*Impact Factor:* 7.9*)*
Electrochimic Acta *(Impact Factor:* 6.9*)*
ChemComm (*Impact Factor:* 6.2*)*
Catalysis Science & Technology (*Impact Factor:* 6.1*)*
ACS Applied Energy Materials (*Impact Factor:* 6.0)
Inorganic Chemistry (*Impact Factor:* 5.2)
ACS Applied Nano Materials (*Impact Factor*: 5.1)
ChemElectroChem *(Impact Factor: 4.6)*
Electroanalysis (*Impact Factor:* 4.5*)*
Journal of Electroanalytical Chemistry (*Impact Factor:* 4.4*)*
Journal of the Electrochemical Society (*Impact Factor:* 4.3*)*
Journal of Physical Chemistry C (*Impact Factor:* 4.1*)*
Langmuir (*Impact Factor:* 3.8*)*
AICHE Journal *(Impact Factor 3.9)*
Industrial Engineering and Chemistry Research *(Impact Factor* 3.7*)*
Analytical Methods (*Impact Factor: 2.9)*

Professional Affiliations:

American Chemical Society
American Institute of Chemical Engineers
Materials Research Society

Technology Transfer

Co-founder of Avium LLC (www.aviumenergy.com) who is commercializing a green hydrogen technology. Participated in a National NSF ICORPS program. Received Phase I and Phase II funding from NSF SBIR program. Currently licensing patents from KU Center for Technology Commercialization.

B. Honors and Awards for Service

2014 Kansas EPSCoR Education and Diversity Award