



Curriculum Vitae - Justin B. Sambur

Monfort Professor of Chemistry

Colorado State University

Phone: 970-420-4279

Email: jsambur@samburneaconsulting.com

[Sambur NEA Consulting Website](#)

Executive Summary of Credentials and Skills

Dr. Justin B. Sambur is widely regarded as an analytical chemistry and materials characterization expert. He specializes in determining the *presence, absence, identity, and quantity* of hazardous or regulated materials in complex systems, and he brings a deep, methodical approach to measurement, data integrity, and clear explanation of findings. Dr. Sambur has spent his career studying materials relevant to energy, sustainability, and advanced manufacturing. He is qualified to opine in matters involving battery, solar, and electrolyzer technologies, nanotechnology and nanoparticle synthesis and characterization, and general materials failures or contamination events. Dr. Sambur has published over 60 peer-reviewed articles in leading chemistry/materials/nanoscience journals such as *Nature*, *Science*, and the *Proceedings of the National Academy of Sciences*. Dr. Sambur has presented over 75 invited lectures at Universities and Scientific Conferences, serves on the Early Career Advisory Board of Chemical & Biomedical Imaging, Executive Board of the Society of Electroanalytical Chemistry, Editorial Advisory Board of ACS Electrochemistry, Advisory Board for NSF's Center for Single-Entity Nanochemistry and Nanocrystal Design and DOE's Liquid Sunlight Alliance Hub.

Expert Witness and Consulting Experience

- Consultant, Advanced 2D Material Synthesis and Chemical Vapor Deposition Growth Processes, Evan Witmer, Jan. 23, 2026
- Expert Witness, Lewis, Brisbois, Bisgaard & Smith LLP, *People of the State of California v. CanAm Minerals, Inc., et. al.*, 2025-present
- Expert, Document Evaluation LLC, Dec 1, 2025-present
- Consultant, CO2RR Membrane Specifications, David Gutman, Sept. 11, 2025
- Consultant, Vorys, Sater, Seymour and Pease LLP, McGlone et al. vs. *Centrus Energy Corp. et al.*, (SEM-EDS analysis), 2024-present
- Consultant, Borch Environmental Pollution Consulting, 2024-present
- Consultant, Voxel Inc., 2010-2011 (AFM analysis)

Patents

- Sambur, J.B.; *et al.* "Enzyme-Modified Two-Dimensional Semiconductor Solar Absorber Materials and Photoelectrochemical Cells Formed Therefrom." *U.S. Patent Application* 19/339,580, filed September 25, 2025.

Honors and Awards

- 2024 Monfort Professor, Colorado State University
- 2022 Alfred P. Sloan Fellow
- 2022 Royce Murray Young Investigator Award, Society of Electroanalytical Chemistry
- 2020 NSF CAREER Award
- 2020 DOE Early Career Award
- 2019 RCSA Scialog Fellow: Advanced Energy Storage
- 2017 Air Force Office of Scientific Research (AFOSR) Young Investigator Award
- 2017 Norman Edmund Inspirational Award (Edmund Optics)
- 2011 NSF American Competitiveness in Chemistry Postdoctoral Fellowship
- 2006 Walter E. Kaskin Award in Physical Chemistry (SUNY-Binghamton)

Professional Appointments

- 2024-2026 Monfort Professor, Colorado State University
- 2022-present Associate Professor, Department of Chemistry, Colorado State University
- 2016-2022 Assistant Professor, Department of Chemistry, Colorado State University
- 2016-present Core Faculty, School of Materials Science and Engineering, CSU

Education and Training

- 2011-2016 NSF Postdoctoral Fellow, Cornell University
Field: Chemistry
Research area: Single-molecule photoelectrocatalysis
Advisor: Peng Chen
- 2006-2011 Ph.D., Colorado State University
Field: Chemistry
Research area: Semiconductor electrochemistry
Advisor: Bruce Parkinson
- 2002-2006 B.S. with Honors, Binghamton University
Field: Chemistry
Research area: Heterogeneous catalysis
Advisor: David Doetschmann

Publications – 64 total publications, 2,647 citations, h-index: 19, i10-index: 33

Independent Career at CSU, *undergraduates

- 39. Salzer, L.D.; Christensen, C.* Gervais, C.Y.*; Squires, A.G.; Manche, A.G.; Lustig, D.; Prieto, A.L.; Neilson, J.R.; Scanlon, D.O.; **Sambur, J.B.** “Structural disorder and Mo substitution enable multi-electron redox in the crystallographic shear compound $\text{Mo}_x\text{Nb}_{12}\text{W}_{1-x}\text{O}_{33}$ ” **2025, in preparation.**
- 38. Almaraz, R.; Tews, A.P.; Sayer, T.; Toole, J.; Ahmadi, M.; Wright, D.; Miller, E.M.; Nazemi, M.; Maldonado, S.; Montoya-Castillo, A.; **Sambur, J.B.** “Giant Band Gap Renormalization Dictates Current–Voltage Behavior of 2D Semiconductor Electrodes” **2025, in preparation.**
- 37. Wang, K.; Geiss, B.* Geiss, R.; Neilson, J.R.; Zak, A.; **Sambur, J.B.** “Quantifying chiral handedness of core-shell inorganic nanotubes via electron microscopy and diffraction” **2025 submitted.**
- 36. Salzar, L. D.; Christensen, C.* Gervais, C. Y.*; Steeley, J. D.; Neilson, J.R.; **Sambur, J. B.**, “Revisiting Li-ion Insertion in $\text{T-Nb}_2\text{O}_5$: Distinct Surface and Bulk Redox Processes Revealed by Slow Scan Cyclic Voltammetry”, **2025, submitted.**
- 35. **Sambur, J.B.** & 75 co-authors, “Gerischer Electrochemistry Today”, *ACS Energy Lett.*, **2025, accepted.**

34. Chard, A. R.; **Sambur, J. B.**; “Measuring the Flatband Potential in 2D Semiconductors: Pitfalls and a Possible SECCM Solution”, *Curr. Opin. Electrochem.* **2025**, 52, 101703.
33. Lustig, D.R.; Buz, E.; Bird, O.F.; Mulvey, J.T.; Patterson, J.P.; Dukovic, G.; Kittilstved, K.R.; **Sambur, J.B.** “Single-Molecule Fluorescence Microscopy Reveals Energy Transfer Active versus Inactive Nanocrystal/Dye Conjugate Pairs”, *Chem. Biomed. Imaging*, **2025**, 3, 8, 547–559.
32. Lustig, D.R.; Chen, F.; Zhang, W.; Bird, O.F.; Fajardo Jr., J.; Ardo, S.; Hu, S.; Talin, A.A.; Bala Chandran, R.; **Sambur, J.B.** “Models and Measurements Quantify Photon Recycling, Charge-Carrier Diffusion, and Photon Scattering Contributions to Photoluminescence in InP Nanowire Arrays” *J. Phys. Chem. C*, **2025**, 129 (17), 8270–8283.
31. Banik, A.; Maekawa, H.; Fajardo, J.; Zutter, B.; Alcorn, F.; Kumar, S.; Watanabe, K.; Kudo, A.; Ge, N.; Talin, A.; **Sambur, J.B.** “Unequal {110} Facets: The Critical Role of Surface Termination in Determining Photoelectrochemical Activity of Single BiVO₄ Particles” *ACS Nano*, **2025**, 19, 6, 6250–6262.
30. Austin, R., Sayer, T., Farah, Y., Montoya-Castillo, A., Krummel, A.T., **Sambur, J.B.**, “Hiding in Plain Sight: The prevalence and impacts of many-body effects in Transient Absorption Spectroscopy Experiments of 2D Semiconductors” *J Chem. Phys.* **2024** 161, 190901, **selected for journal cover**.
29. Toole, J.; **Sambur, J.B.**; “Anodic dissolution rates accelerate with decreasing MoS₂ nanoflake thickness” 2023, *J Electrochem Soc*, 170, 116501.
28. Lustig, D.R.; Buz, E.; Mulvey, J.T.; Patterson, J.P.; Kittilstved, K.R.; **Sambur, J.B.** “Characterizing the Ligand Shell Morphology of PEG-coated ZnO Nanocrystals using FRET Spectroscopy” 2023, *J Phys Chem B*, **2023**, 127, 41, 8961–8973.
27. Almaraz, R.; Sayer, T.; Toole, J.; Austin, R.; Farah, Y.; Trainor, N.; Redwing, J. M.; Krummel, A.; Montoya-Castillo, A.; **Sambur, J.B.** “Quantifying Interfacial Energetics of 2D Semiconductor Electrodes Using in Situ Spectroelectrochemistry and Many-Body Theory” 2023, *Energy Environ. Sci.*, 2023, 16, 4522–4529.
26. Sayer, T.; Farah, Y.R.; Austin, R.; **Sambur, J.B.**; Krummel, A.T.; Montoya-Castillo, A.; “Trion formation resolves observed peak shifts in the optical spectra of transition metal dichalcogenides” *Nano Lett.* 2023, 23, 6035–6041.
25. Lustig, D.R.; Nilsson, Z.N.; Mulvey, J.T.; Zang, W.; Pan, X.; Patterson, J.P.; **Sambur, J.B.** “Towards Imaging Defect-Mediated Energy Transfer Between Single Nanocrystal Donors and Single Molecule Acceptors” *Chem. Biomed. Imaging* 2023, 1, 2, 168–178
24. Austin, R.; Farah, Y.R.; Sayer, T.; Luther, B.M.; Montoya-Castillo, A.; Krummel, A.T.; **Sambur, J.B.** “Hot carrier extraction from 2D semiconductor photoelectrodes” *PNAS*, **2023**, 120 (15) e2220333120.
- News Highlights: (1)** [*“Chemists propose ultrathin material for doubling solar cell efficiency”*](#) – CSU Source, Anne Manning.
23. Salzer, L.D.; Diamond, B.; Nieto, K.; Evans, R.C.; Prieto, A.L.; **Sambur, J.B.**; “Structure-property relationships in high-rate anode materials based on niobium tungsten oxide shear structures” *ACS Appl. Energy Mater.* **2023** 6, 3, 1685–1691
22. Van Erdewyk, M.; Lorenz, D.; **Sambur, J.B.**; “Answering old questions with new techniques: understanding performance-limiting factors in transition metal dichalcogenide photoelectrochemical solar cells” *Current Opinion in Electrochemistry*, **2023**, 37, 101173.
21. Van Erdewyk, M.; **Sambur, J.B.**; “Molecular Reaction Imaging of a Surface Recombination Process Explains Performance Variation Among Smooth MoS₂ Photoelectrodes ” *J. Electrochem. Soc.*, **2022**, 169 096519
20. Marquez, S*; Varra, T*; Christensen, C; Rajasekharan, O; Dojan, C; Hobbs, J; Otten, A; Salzer, L; Schuttlefield-Christus, J.D; **Sambur, J.B.**; “LBIC Imaging of Solar Cells: An Introduction to Scanning Probe-based Imaging Techniques” 2022, *J Chem Ed*, **2023**. 100, 2, 1011–1016

19. Van Erdewyk, M.; **Sambur, J.B.**; “Single nanoflake photoelectrochemistry reveals intra-nanoflake doping heterogeneity that explains ensemble-level photoelectrochemical behavior”, *ACS Appl. Mater. Interfaces*, **2022**, 14, 20, 22737–22746. *invited contribution to Early Career Forum.
 18. Evans, R.C.; Austin, R.; Miller, R.; Preston, A.; Nilsson, Z.N.; Ma, K.; **Sambur, J.B.**; “Surface-Facet-Dependent Electrochromic Properties of WO₃ Nanorod Thin Films: Implications for Smart Windows” *ACS Applied Nano Materials*, 2021, 4, 4, 3750-3759.
 17. Cashen, C.; R. C. Evans; Nilsson, Z.; **Sambur, J.B.**; “Local substrate heterogeneity influences electrochemical activity of TEM grid-supported battery particles” 2021, *Frontiers In Chemistry*, 9, 651248.
 16. Nilsson, Z.; Beck, L.M.; **Sambur, J.B.**; “Ensemble-level energy transfer measurements can reveal the spatial distribution of defect sites in semiconductor nanocrystals” *J Chem Phys, Emerging Investigator Issue, J Chem Phys* **2021**, 154, 054704.
 15. Nilsson, Z.; Van Erdewyk M.; Wang,L; **Sambur, J.B.**; “Molecular Reaction Imaging of Single-Entity Photoelectrodes” *ACS Energy Lett*, **2020**, 5, 5, 1474–1486. *Invited Perspective Article*.
 14. Wang,L; Nilsson, Z.; Tahir, M; Chen, H; **Sambur, J.B.**; “Influence of the substrate on the optical and photoelectrochemical properties of monolayer MoS₂” *ACS Appl. Mater. Interfaces*, **2020**, 12(13), 15034-15042.
 13. Evans, R.C.; Nilsson, Z.; Balch, B.; Wang,L; Neilson, J.R.; Weinberger, C.R.; **Sambur, J.B.**; “Quantifying Capacitive-like and Battery-like Charge Storage Contributions Using Single Nanoparticle Electro-optical Imaging” *ChemElectroChem*, **2020**, 7 (3), 753-760.
 12. *Varra, T; *Simpson, A; *Roesler, B.; Nilsson, Z.; Ryan, D; Van Erdewyk M.; Schuttlefield Christus, J.D.; **Sambur, J.B.**; “A homemade smart phone microscope for single particle fluorescence microscopy” *J Chem. Ed.*, **2020**, 97 (2), 471-478.
 11. Wang, L; Tahir, M; Chen, H; **Sambur, J.B.**; “Probing charge carrier transport and recombination pathways in monolayer MoS₂/WS₂ heterojunction photoelectrodes” *Nano Lett.* **2019**, 19 (12), 9084-9094.
 10. Evans, R.C.; Nilsson, Z.; **Sambur, J.B.**; “High-throughput single nanoparticle electrochemistry using widefield electro-optical imaging” *Anal Chem* **2019**, 91 (23), 14983-14991.
 9. Wang, L; Schmid,M; **Sambur, J.B.**; “Single nanoparticle photoelectrochemistry: what is next?” *J Chem Phys*, **2019**, 151, 180901. *Invited Perspective Article*.
 8. Evans, R.C.; *Ellingworth, A.; Cashen, C.J.; Weinberger, C.R.; **Sambur, J.B.** “Influence of single nanoparticle electrochromic dynamics on the durability and speed of smart windows” *PNAS* **2019**, 116, 12666.
- News Highlights:** (1) “Chemists could make ‘smart glass’ smarter by manipulating it at the nanoscale” – CSU Source, Anne Manning. Also highlighted by ScienceDaily and Nanowerk News. (2) “Performance of ‘Smart’ Glass Improved By Manipulating Nano-Materials” – DesignNews, 27 June, 2019.
7. Wang, L; Schmid, M; Tahir, M; Chen, H; **Sambur, J.B.**; “Laser Annealing Improves Photoelectrochemical Activity of Ultrathin MoSe₂ Photoelectrodes” *ACS Appl. Mater. Interfaces*, **2019**, 11 (21), 19207-19217.
 6. Wang, L.; **Sambur, J.B.**; “Efficient Ultrathin Liquid Junction Photovoltaics Based on Transition Metal Dichalcogenides” *Nano Letters*, **2019**, 19 (5), 2960–2967.
 5. **Sambur, J.B.***; Shepherd, D.P.; Hesari, M; Van Erdewyk, M.; Choudhary, E.; Chen, P.; "Correlated Single-Molecule Reaction Imaging and Photocurrent Measurements Reveal

Underlying Rate Processes in Water Splitting" *J. Electrochem. Soc.*, **2019**, *166* (5), H3286-H3293.
**corresponding author.*

4. Chen, J.; Bailey, C.; Hong, Y.; Wang, L.; Cai, Z.; Shen, L.; Hou, B.; Wang, Y.; Shi, H.; **Sambur, J.B.**; Ren, W.; Pop, Eric; Cronin, S. "Plasmon-Resonant Enhancement of Photocatalysis on Monolayer WSe₂", *ACS Photonics*. **2019**, *6* (3), pp 787-792.

3. Isenberg, A. E., Todt, M. A., Wang, L., **Sambur, J. B.**, "The Role of Photogenerated Iodine on the Energy Conversion Properties of MoSe₂ Nanoflake Liquid Junction Photovoltaics" *ACS Appl. Mater. Interfaces.*, **2018**, *10*(33), 27780–27786.

2. Todt, M.A., Isenberg, A., Miller, E.M., Nanayakkara, S.U., **Sambur, J.B.**, "Single nanoflake photoelectrochemistry reveals champion and spectator nanoflakes in exfoliated MoSe₂ films" *J. Phys. Chem. C.*, **2018**, *122* (12), 6539–6545.

1. Klunder, K.J., Nilsson, Z., **Sambur, J.B.**, Henry, C.S.; "Patternable Solvent-Processed Thermoplastic Graphite Electrodes" *J. Am. Chem. Soc.*, **2017**, *139*, 12623–12631.

Graduate & Postdoctoral

19. Hesari, M., **Sambur, J.B.**, Mao, X., Jung, W., Chen, P.; *Nano Lett.*, **2019**, *19* (2), 958–962.

18. Guanqun, C., Zhou, N., Chen, B., **Sambur, J.B.**, Choudhary, E., Chen, P.; *ACS Cent. Sci.*, **2017**, *3* (11), 1189–1197.

17. **Sambur, J.B.**; Chen, P.; *J. Phys. Chem. C.*, **2016**, *120*, 20668-20676.

16. **Sambur, J.B.**; Chen, T.Y.; Choudhary, E.; Chen, G.; Nissen, E.J.; Thomas, E.M.; Zou, N.; Chen, P.; "Sub-particle reaction and photocurrent mapping to optimize catalyst-modified photoanodes" *Nature*, **2016**, *530*, 77-80. **News Highlights:** (1) "Water splitting: Placing the catalyst where it's needed" *Science*, **2016**, *351*, 828.; (2) "Electrochemistry: Photocatalysis in close up" *Nature* **2016**, *530*, 36-37. (3) "Fluorescence Method Maps Reactivity Hot Spots on a Catalyst's Surface" *Chem. Eng. News* **2016**, *94*, 8; (4) "Researchers seek efficient means of splitting water" *Cornell Chronicle*, Feb 4, **2016**; and at *Phys.org*, *Nanowerk*, *LabManager*.

15. **Sambur, J.B.**; Parkinson, B.A.; *ACS Appl. Mater. Interfaces*, **2015**, *6*, 21916-21920.

14. **Sambur, J.B.**; Chen, P.; *Ann Rev Phys Chem*, **2014**, *65*, 395-422.

13. Shepherd, D.; **Sambur, J.B.**; Liang, Y.; Parkinson, B.A.; Van Orden, A., **2012**, *J. Phys. Chem. C.*, *116*, 21069-21076.

12. Schuttlefield, J.D.; **Sambur, J.B.**; Gelwicks, M.; Eggleston, C.M.; Parkinson, B.A., *J. Am. Chem. Soc.*, **2011**, *133*, 17521-17523.

11. **Sambur, J.B.**; Averill, C.M.; Bradley, C.; Schuttlefield, J.; Lee, S.H.; Reynolds, J.R.; Schanze, K.S.; Parkinson, B.A., *Langmuir*, **2011**, *27*, 11906-11916.

10. Riha, S.; Fredrick, S.; **Sambur, J.B.**; Liu, Y.; Prieto, A.; Parkinson, B.A., *ACS Appl. Mater. Interfaces*, **2011**, *3*, 58-66.

9. **Sambur, J. B.**; Novet, T.; Parkinson, B. A., "Multiple Exciton Collection in a Sensitized Photovoltaic System" *Science* **2010**, *330*, 63-66. **News Highlights:** (1) "Solar Cell Captures Multiple Excitations", *C&E News*, **88** (40), p. 34. Oct., 2010. (2) "Multiple exciton collection could result in more efficient solar cells", *PhysOrg.com*, (3) "Bright idea puts UW professor in international spotlight", *Wyoming Tribune Eagle*,

8. Manandhar, K.; **Sambur, J. B.**; Parkinson, B. A., *J. Appl. Phys.* **2010**, *107*, 063716.

7. **Sambur, J. B.**; Parkinson, B. A., *J. Am. Chem. Soc.* **2010**, *132*, 2130-2131.

6. **Sambur, J. B.**; Riha, S. C.; Choi, D.; Parkinson, B. A., *Langmuir* **2010**, *26*, 4839-4847.

5. Jäckel, B.; **Sambur, J.B.**; and Parkinson, B.A., *J. Phys. Chem B.*, **2009**, *113*, 1837-1849.

4. Jäckel, B.; **Sambur, J. B.**; Parkinson, B. A., *J. Appl. Phys.* **2008**, *103*, 063719.

3. Jäckel, B.; **Sambur, J. B.**; Parkinson, B. A., *Langmuir* **2007**, *23*, 11366-11368.

2. Sambur, J. B.; Doetschman, D. C.; Yang, S. W.; Schulte, J. T.; Jones, B. R.; DeCoste, J. B., *Micropor Mesopor Mat* **2008**, *112*, 116-124.

1. Yang, S.W.; Doetschman, D.C.; Schulte, J.T.; **Sambur, J.B.;** Kanyi, C.W.; Fox, J.D.; Kowenje, C.O.; Jones, B.R.; Sharma, N.D.; *Micropor Mesopor Mat* **2006**, *92*, 56-60.

Technical Expertise

Dr. Sambur is an expert in scanning electron microscopy-energy dispersive X-ray microscopy (SEM-EDS), transmission electron microscopy (TEM), Raman spectroscopy, photoluminescence (PL) micro-spectroscopy, X-ray photoelectron spectroscopy (XPS), scanning probe microscopy (STM and AFM), single molecule fluorescence microscopy, electrochemistry, and scanning electrochemical microscopy (SECM and SECCM).

Teaching Experience (8 different courses taught to 494 students)

<u>Semester/Year</u>	<u>Course No./Title</u>	<u>Cr. Hrs.</u>	<u>Enrollment</u>
S24, S23, S22, S19	CHEM537 - Electrochemical Methods	3	44
F23, F22, F21, S21, F19, S19	MSE 502C - Materials Microscopy	1	44
F20	CHEM 111 - General Chemistry I	3	203
S23, S22, S20	MSE502D - Materials Spectroscopy	1	15
F19, F18, F17	CHEM335 - Introduction to Analytical Chemistry	3	123
2016	CHEM530F - Advanced Topics in Chemical Analysis	1	23
2016	CHEM550C - Nanomaterials	1	22
2016	CHEM550A - Hard Materials	1	21

Professional Activities

Editorial Boards

Board of Directors, Society of Electroanalytical Chemistry (2022-2027)

ACS Chemical and Biomedical Imaging, Early Career Advisory Board

ACS Electrochemistry, Editorial Advisory Board

Advisory Boards

Member, NSF Center for Single-Entity Nanochemistry and Nanocrystal Design

Member, DOE Solar Fuels Hub - Liquid Sunlight Alliance

Conference & Workshop Organization.

Chair, Aug 6-8, 2024, 2nd Gerischer Electrochemistry Meeting, Fort Collins, CO

Co-Organizer, Mar 10-14, MRS Spring 2023 National Meeting, “Symposium NM02—2D Materials for Electrochemical Applications—Leading the Charge Through Thermodynamic and Kinetic Knowledge Gaps”, San Francisco, CA

Co-Organizer, Aug 21-25, ACS Fall 2022 National Meeting, CATL Division Symposium titled “High spatial resolution analysis of catalytic systems”, Chicago, IL.

Co-Chair, Aug 7, 2022, Stille Symposium in Tribute to C. Michael Elliott, Fort Collins, CO
Co-Organizer, Mar 20-24, ACS Spring 2022 National Meeting, CATL Division Symposium titled “*High spatial resolution analysis of catalytic systems*”, San Diego, CA.

Co-Chair, May 31 2021, 239th ECS National Meeting, Grahame Award Symposium, Chicago, IL

Co-Organizer, Aug 25-29, ACS Fall 2019 National Meeting, PHYS Division Symposium titled “*Getting to the Bottom: Optical and Electron Imaging of Reactive Chemical Systems*”, Orlando, FL.

Chair, Jan 16-17 2020, 51st Society for Western Analytical Professors Meeting, Ft. Collins, CO.

Professional Affiliations

American Chemical Society

Electrochemical Society

Materials Research Society

Society of Electroanalytical Chemistry

Sigma Xi

Verified Journal Referee Services According to Publons (97 reviews of 97 manuscripts)

ACS Appl Energy Mater; ACS Appl Mater & Inter; ACS Catalysis, ACS Energy Letters, ACS Nano; Adv Electron Mater; Adv Func Mater; Anal Chem; Anal Chim Acta; Angewandte Chemie; ChemComm; ChemElectroChem; ChemNanoMat; Dalton Trans; Electrochem Sci Adv; Electrochimica Acta; Frontiers in Chem; Joule; J Appl Phys; JACS; J Chem Ed; J Chem Phys; J Electrochem Soc; J Hazard Mater; J Mater Res; J Mater Chem A; J Phys Chem; J Phys Chem Lett; Langmuir; Materials; Mater Today Phys; Mater Chem Phys; Micropor Mesopor Mater; Nanomaterials; Nanoscale; Nano Lett; Nature Chem; Nature Commun; Nature Energy; Nature Nanotech; New J Phys; PNAS; Sci Adv; Small Methods

Grant Referee Services

Department of Energy, Israeli Ministry of Innovation, Science & Technology, National Science Foundation, ACS Petroleum Research Fund, Air Force Office of Scientific Research, European Research Council, Swedish Research Council (Vetenskapsrådet), Netherlands Organisation for Scientific Research (NWO)

38 Invited National Lab/University/Department Seminars (Since August 2016)

Postponed due to COVID-19: Univ. of Akron; Nanjing University, Univ. of New Mexico, ***2024:*** State University at Buffalo (Fall 2024), University of Arkansas (4/15); ***2023:*** University of Milan (9/8); CSU Powerhouse (2/21), *Student Invited Speaker – University of Minnesota* (2/14), Michigan State University (2/6); Binghamton University (1/23); UNC-Greeley (9/29); ***2022:*** Cornell University (4/4); Univ. of Washington (10/3); CU-Boulder (4/24); ***2021:*** Univ. Wisconsin-Oshkosh (12/3), Univ. Houston (9/28), UNC-Greeley (9/17), Indiana Univ. (9/9), Univ. of Texas-Austin (4/22), Pennsylvania State University (3/8), Missouri University of Science & Technology (3/1), Univ. of Wisconsin-Madison (2/2), Univ. of Arizona (2/10). ***2020:*** UMass Amherst (12/3), UNC Chapel Hill (11/11), Rutgers University (10/27), Arizona State University (2/28), Washington University-St. Louis (2/13). ***2019:*** TU-Darmstadt (3/26), Metro State University (5/3), Temple University (9/5), University of Wyoming (10/25), University of Oregon (12/6). ***2018:*** University of Colorado-Denver (10/4) ***2017:*** University of New Hampshire (10/2), CSU Department of Physics (2/12). ***2016:*** National Renewable Energy Lab (12/14), University of Northern Colorado-Greeley (10/21), CSU Chem&Bio Eng. (9/22).

21 Invited & 17 Contributed Conference Talks (Since August 2016)**

2024: **Gordon Research Conference – Solar Fuels – Ventura, CA (1/8-1/12); **2023:** **SPIE Meeting, 2D Materials Symposium, San Diego, CA (8/23); ***Keynote Speaker*, Global Summit on Nanotechnology and Materials Science (GSNMS), Rome, Italy (9/14); **NanoSeries Invited Speaker, Madrid, Spain (6/17); **Invited Speaker, Grahame Award Symposium in Honor of Keith Stevenson, Philadelphia, PA (3/22); **Spring 2023 ECS National Meeting, 1 invited talk and 2 contributed talks, Boston, MA (5/8-6/2); Spring MRS Meeting, San Francisco, CA (4/10); **2022:** **Gordon Research Conference, Electrochemistry, Ventura, CA (9/13); **ISN2A - 5th Inter. Symposium on Nanoparticles (1/24), **Pittcon Murray Award Presentation (3/5), **ACS Spring Meeting (*Charge & Energy Transfer at the Nanoscale*, 3/20), **ECS Meeting (*B06 Symposium - 2D layered materials*, 5/29); **ACS Fall Meeting, 1 invited and 2 contributed talks (8/19-8/24), **2021:** **PacifiChem (virtual talk), **DOE Solar Photochemistry PI Meeting (virtual talk, 6/4), 239th ECS National Meeting (*Recorded Virtual Talk*, 5/30), **Probing Chemical Reactions by Single-Molecule Spectroscopy Workshop (6/8) **2020:** **237th ECS National Meeting (postponed), **260th ACS National Meeting *Broadcast Talk* (8/16), AFOSR Molecular Dynamics and Theoretical Chemistry Program Review (5/19), 51st Society of Western Analytical Professors Meeting (1/20) **2019:** 50th Society of Western Analytical Professors (1/20), Probing Chemical Reactions by Single-Molecule Spectroscopy Workshop (3/27), MRS Meeting (4/22), ECS Meeting (5/26), ACS Meeting (8/25). **2018:** 49th Society of Western Analytical Professors Meeting (1/26), MRS Meeting (4/6), ECS Meeting (5/15), Gerischer Symposium (8/15) **2017:** **Telluride Summer Research Conference *Solar Solutions Workshop* (6/26), **ACS Rocky Mountain Meeting *Young Talent in CO Symposium* (10/2).

Collaborators, Postdoctoral Associates, and Students

4 Postdoctoral Associates

Dr. Li Wang (now at CAS)
 Dr. Duncan Ryan (now at LANL)
 Dr. Michael A. Todt (now at NOAA)
 Avishek Banik (current)

4 Ph.D. Students Conferred.

R. Colby Evans (now at NIST)
 Zach Nilsson (now at Edinburgh Instruments)
 Michael Van Erdewyk (now at Prieto Battery)
 Justin Toole (now Asst. Prof. at West Point)

7 Current Ph.D. Students

Rafael Almaraz (MSE)
 Dani Lustig
 Rachelle Austin
 Dakota Lorenz
 Luke Salzer
 Austin Tews
 Juniper Morales

5 M.S. Students Conferred

Merranda Schmid
 Travis Varra (now at Prieto Battery)
 Christy Cashen
 Lacey Beck (now at Kuntze)
 Allan Isenberg (now at Chevron Oronite)

1 Current M.S. Student

Rabeya Binta Alam (Physics)

16 Undergraduate Students

Parker Dunham

Claire Gervais

Cami Christensen

Jenna Salvat

Ben Bullock

Esther van de Lagemaat

Brian Diamond (now PhD in Chemistry at University of Oregon)

Steven Marquez

Trista Punt (attending Medical School at Rocky Vista University)

Austin Ellingsworth (NSF Statistics REU, now CSU Statistics PhD student)

Travis Varra (MS with Sambur group, now at Prieto Battery)

John Ottoson (Chemical & Biological Engineering)

Amy Simpson

Hannah Goodman (now PhD student at Arizona Chemistry)

Victoria Bachtell

Ana I. De la Fuente Durán (now a PhD student at Stanford)

6 MURALS Undergraduate Advisees

Jimena Firo

Peter Zhang

Arianna Dickerson

Erika Jensen

Graham Smith

Ethan Zerba

2 NSF REU Advisees

Dr. Dominic Ross (NSF Chemistry REU, PhD with Song Jin at UW-Madison Chem)

Lauren Isenhour (NSF Chemistry REU)

Academic Advisor to Undergraduate Students (Total 8)

Hailey Cirino

Matthew Clarke

Dru Copeland

Trent DeHerrera

Leonardo Ignacio

Haley Mcdaniel

Hanna McKean

Samantha Vazquez

3 High School Students

Om Rajasekharan (Fort Collins High School, Ft. Collins, CO)

Conner Pettit (Regis Jesuit High School, Aurora, CO)

Max Warnock (Poudre Global Academy, Ft. Collins, CO)

Research Support

Active External Grants

DOE Energy Frontier Research Center	Sambur (Co-PI)	\$900,000	08/22 – 07/26
-------------------------------------	----------------	-----------	---------------

Title: Ensembles of Photosynthetic Nanoreactors (EPN)

Objectives: EPN aims to demonstrate pathways to meet the DOE H₂ Earthshot targets by revealing codesign strategies that enable (E)nsembles of (P)hotosynthetic (N)anoreactors to operate at >10% solar-to-hydrogen energy conversion (STH) efficiency.

Toyota Research Inst. North America Sambur (PI) \$240,000 02/23 – 03/25

Title: Utilizing High Energy Quantum States in 2D Materials for Bio-inspired Photocatalysis & Solar Energy Conversion

Objectives: Proof-of-concept demonstration that bio-inspired photocatalytic approach enables utilization of high energy quantum states for novel reactivity.

ACS Petroleum Research Fund Sambur (PI) \$110,000 01/23 – 08/25

Title: Fundamental Single Particle-level Studies of Chiral Inorganic Nanotubes: Toward Asymmetric Heterogeneous Photocatalysis

Objectives: This ACS PRF ND project advances chiral inorganic nanotubes (INTs), based on earth abundant MoS₂ and WS₂, that can derive enantioselective photo-activity from their intrinsically chiral structure instead of chiral ligands. Intrinsically chiral photocatalysts offer the intriguing possibilities of using left- or right-handed circularly polarized light to control the chirality of product molecules and easy product separation.

NSF CMI Sambur (PI) \$524,290 08/22 – 07/25

Title: Quantitative Scattering Microscopy (QSCAT) for Nanoscale Imaging of Ion Insertion Chemistry

Objectives: The overall goal of this project is to develop a simple, selective, sensitive, and high throughput optical microscopy technique to study ion insertion chemistry at the nanoscale.

Alfred P. Sloan Fellowship Sambur (PI) \$75,000 05/22 – 04/24

Title: Nanoscale Imaging Will Uncover Design Principles for Energy Materials

Objectives: The overall goal of this proposal is to advance in situ ultrafast transient absorption spectroscopy capabilities in the PI's lab.

DOE Early Career Program Sambur (PI) \$750,000 09/20 – 08/25

Title: Controlling Interfacial Energetics and Charge Transfer Rates in 2D Semiconductors: Fundamental Studies En Route to Photoelectrochemical Energy Conversion Beyond the Shockley-Queisser Limit

Objectives: The overall goal of this proposal is to develop novel electrochemical methods to study energy level alignment at 2D semiconductor/electrolyte interfaces.

NSF CAREER Sambur (PI) \$674,950 03/21 – 02/26

Title: CAREER: Quantifying electronic structure changes upon ion insertion in transition metal oxides via single particle electro-optical microscopy

Objectives: The research focuses on Wadsley-Roth (W-R) shear structures that exhibit extraordinarily fast Li-ion diffusion coefficients. Aim #1 focuses on macroscale disorder; we will quantify how particle size, morphology, defect phases, and crystallographic facets influence Li-

ion diffusivity. Aim #2 centers on atomic-level disorder: we will study how cation disorder influences Li-ion diffusivity and electronic conductivity.

Completed External Grants

Air Force Young Investigator Award Sambur (PI) \$360,000 04/17 – 04/20

Title: Super-Resolution Imaging of Charge Carrier Recombination and Transport in Ultrathin Liquid Junction Photovoltaics

Major goal: To understand how defects on semiconductor nanosheet surfaces impact charge carrier recombination and transport in model liquid junction photovoltaics.

Expert not retained