

# Dr. Rachel Woods-Robinson

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## EDUCATION

### University of California, Berkeley

Aug. 2016 – Sep. 2021

*Ph.D., Applied Science and Technology, GPA: 3.753 out of 4.00*

*Berkeley, CA*

Major Field of Study: Materials Physics

Thesis: “Bridging the Computational-Experimental Divide to Design Transparent Contact Materials for Solar Energy”

Funding: Chancellor’s Fellowship, NSF GRFP Fellowship

### University of California, Los Angeles

Sep. 2009 – Dec. 2013

*2013 B.S. Physics, Magna Cum Laude, GPA: 3.83 out of 4.00*

*Los Angeles, CA*

Minor: Environmental Systems and Society

Foreign studies: Intensive Language Program Fall 2011, University of Granada, Spain

## RESEARCH EXPERIENCE

### Postdoctoral Scholar

Oct. 2021 – Oct. 2022

*Lawrence Berkeley National Laboratory (LBNL),*

*Berkeley, CA*

Supervisor: Prof. Kristin A. Persson

- Conducted research on computational *ab initio* modeling of semiconductor absorption processes and semiconductor alloys for solar energy applications.

### Graduate Research Assistant

Aug. 2016 – Sep. 2021

*UC Berkeley, Lawrence Berkeley National Laboratory (LBNL),*

*Berkeley, CA*

Advisor: Prof. Kristin A. Persson

- Conducted research on high-throughput, experiment-guided computational discovery of renewable energy materials, in particular contact materials and p-type transparent conductors for photovoltaic and energy applications.
- Authored 8 first-authored papers (5 peer-reviewed publications, 1 in review, 1 in preparation, 1 conference paper), contributed to 8 co-authored publications, and delivered 13 conference presentations (7 oral, 6 poster), 3 invited seminar talks, and multiple informal group meeting presentations and tutorials.
- Contributed to the Python Materials Genomics (pymatgen) code base and to the dissemination of the Materials Project ([www.materialsproject.org](http://www.materialsproject.org)).
- Participant in the Center for Next-Generation of Materials by Design (DOE Energy Frontier Research Center).

**Graduate Research Intern***Photovoltaics Laboratory, École Polytechnique Fédérale de Lausanne (EPFL)***July 2019 – Sep. 2019***Neuchâtel, Switzerland*

Mentors: Dr. Angela N. Fioretti, Dr. Mathieu Boccard

- Participated in a two-month graduate fellowship incorporating p-type transparent conductors into silicon heterojunction (SHJ) solar cell devices.
- Synthesized wide gap p-type semiconductors using combinatorial sputtering.
- Simulated solar cell heterojunction devices using the AFORS-HET software.

**Collaborative Research Fellow***National Renewable Energy Laboratory (NREL)***Aug. 2016 – July 2019***Golden, CO*

Mentor: Dr. Andriy Zakutayev

- Conducted research on combinatorial sputtering and high-throughput materials characterization to explore the thermodynamic phase space of new chalcogenide and pnictide materials predicted by my computational investigations.
- Led the group's collaboration on X-ray synchrotron techniques and spectroscopy.

**Research Associate***Materials Science Division, Lawrence Berkeley National Laboratory***Mar. 2014 – Jan. 2016***Berkeley, CA*

Advisor: Prof. Joel W. Ager

- Developed and analyzed transparent conducting materials (TCMs) for photovoltaic applications.
- Synthesized thin films using physical and chemical deposition methods, characterized structural, electronic and optical properties, and designed and tested photovoltaic devices.
- Wrote abstracts, research papers, and synchrotron beam time proposals; design posters and presentations.
- Mentored and designed research projects for student interns.
- Served as Superuser for pulsed laser deposition tool: trained all new users and conducted maintenance on vacuum pumps, lasers, toxic gas regulators, etc.

**Research Associate***Earth Planetary and Space Sciences, UCLA***Sep. 2013 – Mar. 2014***Los Angeles, CA*

Advisor: Prof. David Paige

- Developed a Mathematica model to determine thermophysical properties (specific heat and thermal conductivity) of low-temperature (20–100 K) lunar regolith soil based on solid state physics and intrinsic material properties (density, composition, crystallinity). This model replaced the previously-used, non-physical fits that were inaccurate at low temperatures, and is now used in analysis by the Lunar Diviner Radiometer, an instrument on the Lunar Reconnaissance Orbiter.
- Wrote proposals, attended meetings and presented at conferences.
- Afterwards (2015–2016), collaborated on a NASA Research Opportunities in Space and Earth Sciences (ROSES) grant to experimentally measure thermal properties at Jet Propulsion Laboratory. My theoretical findings motivated this study.

**Summer REU Research Assistant***Geological Engineering, University of Wisconsin, Madison***June 2013 – Aug. 2013***Madison, WI*

Advisor: Prof. James Tinjum

- Developed a life-cycle assessment (LCA) model of geothermal heat pumps and HVAC scenarios to compare the greenhouse gas emissions over their entire lifetimes. Funding was through NSF's Research Experiences for Undergraduates (REU) program.
- Contributed to field-work and construction of a residential geothermal heat pump in Wisconsin.

- Nominated to attend the Conference of Research Experiences for Undergraduates Student Scholarship (CREUSS) in Arlington, VA.

**Research Assistant**

*Earth Planetary and Space Sciences, UCLA*

Advisor: Prof. David Paige

**July 2012 – Sep. 2012**

*Los Angeles, CA*

- Built computer model to determine energy return rate, costs and CO<sub>2</sub> release in compressed natural gas (CNG) systems.

**Undergraduate Research Assistant**

*Materials Science, UCLA*

Mentors: Prof. Yang Yang, Dr. Steve Hawks

**Mar. 2012 – July 2012**

*Los Angeles, CA*

- Synthesized solar cell devices by spin coating and electrodeposition in polymer PV laboratory clean room.
- Used spectroscopic ellipsometry to determine the index of refraction of specific substrate materials, fundamental in selecting and creating materials best suited for use as polymer solar cells.
- Assisted other researchers in writing and editing manuscripts, reports and proposals.

## WRITING

### PUBLICATIONS

**Woods-Robinson, R.**, Horton, M. K., & Persson, K. A. (2023). A method to computationally screen for tunable properties of crystalline alloys. Accepted in *Patterns*. *arXiv preprint arXiv:2206.10715*. Preprint: <https://arxiv.org/abs/2206.10715>

Yang, R., McCandler, C., Andriuc, O., Siron, M., **Woods-Robinson, R.**, Horton, M., Persson, K. (2022). Big data in a nano world: a review on computational, data-driven design of nanomaterials structures, properties, and synthesis. *ACS Nano*, 16 (12), 19873-19891. DOI: [10.1021/acsnano.2c08411](https://doi.org/10.1021/acsnano.2c08411)

Culman, T., **Woods-Robinson, R.**, Mangum, J. S., Smaha, R. W., Rom, C., Zakutayev, A., & Bauers, S. R. (2022). Nitrogen stabilizes the wurtzite polymorph in  $\text{ZnSe}_{1-x}\text{Te}_x$  thin films. *Journal of Materials Chemistry C*, 10 (42), 15806-15815. DOI: [10.1039/D2TC02716J](https://doi.org/10.1039/D2TC02716J).

Andreasen, J. W., Bowers, J. W., Breternitz, J., Dale, P. J., Dimitrievska, M., Fermin, D. J., ... & **Woods-Robinson, R.** (2022). Indium-free CIGS analogues: general discussion. *Faraday Discussions*. DOI: [10.1039/D2FD90055F](https://doi.org/10.1039/D2FD90055F).

**Woods-Robinson, R.**, Stevanović, V., Lany, S., Heinselman, K. N., Horton, M. K., Persson, K. A., & Zakutayev, A. (2022). Role of disorder in the synthesis of metastable zinc zirconium nitrides. *Physical Review Materials*, 6(4), 043804. DOI: [10.1103/PhysRevMaterials.6.043804](https://doi.org/10.1103/PhysRevMaterials.6.043804). Preprint: <https://arxiv.org/abs/2012.12455>.

Horton, M. K., & **Woods-Robinson, R.** (2021). Addressing the critical need for open experimental databases in materials science. *Patterns*, 2(12), 100411. DOI: [10.1016/j.patter.2021.100411](https://doi.org/10.1016/j.patter.2021.100411).

Husein, S., **Woods-Robinson, R.**, & Saive, R. (2021, June). Delayed PV Deployment Negates CO<sub>2</sub> Benefits of Ultra-Low Carbon PV Modules. In *2021 IEEE 48th Photovoltaic Specialists Conference (PVSC)* (pp. 2403-2406). IEEE. DOI: [10.1109/PVSC43889.2021.9518474](https://doi.org/10.1109/PVSC43889.2021.9518474).

Ganose, A., Park, J., Faghaninia, A., R., **Woods-Robinson, R.**, Persson, K. A., Jain, A. (2021). Efficient calculation of carrier scattering rates from first principles. *Nature communications*, 12(2222), 1-9. DOI: [10.1038/s41467-021-22440-5](https://doi.org/10.1038/s41467-021-22440-5). Preprint: <https://arxiv.org/abs/2008.09734>.

**Woods-Robinson, R.**, Fioretti, A. N., Haschke, J., Boccard, M., Persson, K. A., Ballif, C. (2020). Evaluating materials design parameters of hole-selective contacts in silicon solar cells. *IEEE Journal of Photovoltaics*, 11(2), 247-258. DOI: [10.1109/JPHOTOV.2020.3038330](https://doi.org/10.1109/JPHOTOV.2020.3038330).

**Woods-Robinson, R.**, Fioretti, A. N., Haschke, J., Boccard, M., Persson, K. A., Ballif, C. (2020). Linking simulation and synthesis of nickel oxide hole-selective contacts for silicon heterojunction solar cells. *2020 47th IEEE Photovoltaic Specialists Conference (PVSC)*, 0569-0573, IEEE. DOI: [10.1109/PVSC45281.2020.9300564](https://doi.org/10.1109/PVSC45281.2020.9300564)

Greenaway, A. L., Melamed, C. L., Tellekamp, M. B., **Woods-Robinson, R.**, Toberer, E. S., James R. Neilson, J. R., Tamboli, A. C. (2020) Chemistry, Defects, and Synthesis of Ternary Nitrides for Emerging Device Applications. *Annual Review of Materials Research*, 51. DOI: [10.1146/annurev-matsci-080819-012444](https://doi.org/10.1146/annurev-matsci-080819-012444). Preprint: <https://arxiv.org/abs/2010.08058>.

Melamed, C. L., Pan, J., Mis, A., Heinselman, K., Schnepf, R., **Woods-Robinson, R.**, Cordell, J., Lany, S., Toberer, E., Tamboli, A. (2020). Combinatorial investigation of structural and optical properties of cation-disordered ZnGeN<sub>2</sub>. *Journal of Materials Chemistry C*, 8, 8736-8746. DOI: [10.1039/DoTC01675F](https://doi.org/10.1039/DoTC01675F).

**Woods-Robinson, R.**, Ablekim, T., Norman, A., Johnston, S., Persson, K. A., Reese, M. O., Metzger, W. K., Zakutayev, A. (2020). Sputtered p-type Cu<sub>x</sub>Zn<sub>1-x</sub>S Back Contact to CdTe Solar Cells. *ACS Applied Energy Materials*, 3(6), 5427-5438. DOI: [10.1021/acsaem.0c00413](https://doi.org/10.1021/acsaem.0c00413).

Greenaway, A., Loutris, A., Heinselman, K., Melamed, C., Schnepf, R., Tellekamp, M. B., **Woods-Robinson, R.**, ... Zakutayev, A. (2020). Combinatorial Synthesis of Magnesium Tin Nitride Semiconductors. *Journal of the American Chemical Society*, 142(18), 8421-8430. DOI: [10.1021/jacs.0c02092](https://doi.org/10.1021/jacs.0c02092).

**Woods-Robinson, R.**, Han, Y., Zhang, H., Ablekim, T., Khan, I., Persson, K. A., Zakutayev, A. (2020). Wide Band Gap Chalcogenide Semiconductors. *Chemical Reviews*, 120(9), 4007-4055. DOI: [10.1021/acs.chemrev.9b00600](https://doi.org/10.1021/acs.chemrev.9b00600).

**Woods-Robinson, R.**, Han, Y., Mangum, J. S., Melamed, C.L., Gorman, B. P., Mehta, A., Persson, K. A., Zakutayev, A. (2019). Combinatorial Tuning of Structural and Optoelectronic Properties in Cu<sub>x</sub>Zn<sub>1-x</sub>S. *Matter*, 1(4), 862-880. DOI: [10.1016/j.matt.2019.06.019](https://doi.org/10.1016/j.matt.2019.06.019).

**Woods-Robinson, R.**, Siegler, M. A., Paige, D. A. (2019). A Model for the Thermophysical Properties of Lunar Regolith at Low Temperatures. *Journal of Geophysical Research: Planets*, 124(7), 1989-2011. DOI: [10.1029/2019JE005955](https://doi.org/10.1029/2019JE005955).

Bauers, S. R., Holder, A., Sun, W., Melamed, C. L., **Woods-Robinson, R.**, Mangum, J., Perkins, J., Tumas, W., Gorman, B., Tamboli, A., Ceder, G., Lany, S., Zakutayev, A. (2019). Ternary Nitride Semiconductors in the Rocksalt Crystal Structure. *Proceedings of the National Academy of Sciences*, 116(30), 14829-14834. DOI: [10.1073/pnas.1904926116](https://doi.org/10.1073/pnas.1904926116).

Talley, K. R., Mangum, J., Perkins, C. L., **Woods-Robinson, R.**, Mehta, A., Gorman, B. P., Brennecke, G.L., Zakutayev, A. (2019). Synthesis of Lanthanum Tungsten Oxynitride Perovskite Thin Films. *Advanced Electronic Materials*, 5(7), 1900214. DOI: [10.1002/aelm.201900214](https://doi.org/10.1002/aelm.201900214).

**Woods-Robinson, R.**, Broberg, D., Faghaninia, A., Jain, A., Dwaraknath, S. S., Persson, K. A. (2018). Assessing High-Throughput Descriptors for Prediction of Transparent Conductors. *Chemistry of Materials*, 30(22), 8375-8389. DOI: [10.1021/acs.chemmater.8b03529](https://doi.org/10.1021/acs.chemmater.8b03529).

**Woods-Robinson, R.**, Huck, P. (2018). Transparent Conductors. *MPContribs*. [https://contribs.materialsproject.org/transparent\\_conductors/](https://contribs.materialsproject.org/transparent_conductors/).

Maurya, S. K., Liu, Y., Xu, X., **Woods-Robinson, R.**, Das, C., Ager III, J. W., Balasubramanian, K. R. (2017). High figure-of-merit p-type transparent conductor, Cu alloyed ZnS via radio frequency magnetron sputtering. *Journal of Physics D: Applied Physics*, 50(50), 505107. DOI: [10.1088/1361-6463/aa95b3](https://doi.org/10.1088/1361-6463/aa95b3).

Becker, J. J., Xu, X., **Woods-Robinson, R.**, Campbell, C. M., Lassise, M., Ager, J., Zhang, Y. H. (2017). CuZnS hole contacts on monocrystalline CdTe solar cells. In *Photovoltaic Specialist Conference (PVSC), 2017 IEEE 44<sup>th</sup>, Conference Proceedings*. IEEE, 3410-3412. DOI: [10.1109/PVSC.2017.8366221](https://doi.org/10.1109/PVSC.2017.8366221).

Morales-Masis, M., De Wolf, S., **Woods-Robinson, R.**, Ager, J. W., Ballif, C. (2017). Transparent Electrodes for Efficient Optoelectronics. *Advanced Electronic Materials*, 3(5), 1600529. DOI: [10.1002/aelm.201600529](https://doi.org/10.1002/aelm.201600529).

**Woods-Robinson, R.**, Cooper, J. K., Xu, X., Schelhas, L. T., Pool, V. L., Faghaninia, A., Lo, C., Toney, M. F., Sharp, I. D., Ager III, J. W. (2016). P-type Transparent Cu-Alloyed ZnS Deposited at Room Temperature. *Advanced Electronic Materials*. 2(6), 1500396. DOI: [10.1002/aelm.201500396](https://doi.org/10.1002/aelm.201500396).

**Woods-Robinson, R.**, Xu, X., Ager III, J. W. (2015). Low-temperature synthesized, p-type transparent conducting material for PV devices. In *Photovoltaic Specialist Conference (PVSC), 2015 IEEE 42nd* (pp. 1-3). IEEE. DOI: [10.1109/PVSC.2015.7355698](https://doi.org/10.1109/PVSC.2015.7355698).

Chen, L., Yang, J., Lee, L. J., Klaus, S., **Woods-Robinson, R.**, Ma, J., Lum, Y., Cooper, J. K., Toma, F. M., Wang, L-W, Sharp, I. D., Bell, A. T., Ager III, J. W. (2015). P-type Transparent Conducting Oxide/n-type Semiconductor Heterojunctions for Efficient and Stable Solar Water Oxidation. *Journal of the American Chemical Society*. 137(30), 9595-9603. DOI: [10.1021/jacs.5b03536](https://doi.org/10.1021/jacs.5b03536).

Chen, L., Yang, J., Lee, L., Klaus, S., **Woods-Robinson, R.**, Lum, Y., Cooper, J.K., Sharp, I.D., Bell, A.T. and Ager, J.W. (2015). P-Type Transparent Conducting Oxide Protection Layers for Sustainable Photoelectrochemical Water Oxidation. *ECS Transactions*, 66(6), 115. DOI: [10.1149/06606.0115ecst/meta](https://doi.org/10.1149/06606.0115ecst/meta).

**Woods-Robinson, R.**, Paige, D. A. (2014). Low Temperature Thermal Properties of Lunar Soil. *Proceedings of the Lunar and Planetary Science Conference*. Vol. 45.

## PUBLICATIONS IN REVIEW

Woods-Robinson, R. (2022). The carbon cost of a PhD in solar cell materials. *arXiv preprint arXiv:2212.10000*. Preprint: <https://arxiv.org/abs/2212.10000>

## PUBLICATIONS IN PREPARATION

**Woods-Robinson, R.**, Morales Masis, M., Crovetto, A., Hautier, G. (2022). From the screen to the sun: disconnects and prospects in materials discovery of p-type transparent conductors for solar photovoltaics. In preparation.

**Woods-Robinson, R.**, Dimitrievska, M. (2022). Emerging inorganic materials in thin-film photovoltaics: reflections from the Faraday Discussions. In preparation for publication in *Faraday Discussions*.

**Woods-Robinson, R.**, Persson, K. A., & Zakutayev, A. (2022). Mapping combinatorial phase space of barium tin sulfide thin films. In preparation.

Mathews, B., **Woods-Robinson, R.**, Zakutayev, A., Arca, E. (2022). Zn-W-N and Zn-(Mo-W)<sub>N</sub> Ternary Nitride Alloys: role of the transitional metal in tuning their Structure, Optical and Electronic Properties. In preparation.

## EDITORIAL AND OPINION WRITING

**Woods-Robinson, R.,** Velan, V., Warner, I., Case, E., Poppiti, A., Abramowitz, B. (2021). The Federal Science Project: a scientist in every classroom. *Journal of Science Policy and Governance*. 18(03). DOI: <https://doi.org/10.38126/JSPG180308>

**Woods-Robinson, R.** (2020). A stay-at-home scientist's strategy for synthesizing sustainable support structures. *Chemistry of Materials*. 32(12), 4856–4858. DOI: [10.1021/acs.chemmater.0c02027](https://doi.org/10.1021/acs.chemmater.0c02027)

**Woods-Robinson, R.** (2020). *A Swiss Science Soirée and the Fine Art of Frolicking with Failure*. ThinkSwiss Research Scholarship Blog. <https://thinkswiss.org/testimonials/>

**Woods-Robinson, R.** (2019). *Cycle for Science Netherlands Blog*. Cycle for Science webpage. <http://cycleforscience.org/xnetherlands-blog>

**Woods-Robinson, R.** (2018). *California on the cusp of 100% clean energy*. Personal blog. <https://www.rachelectron.org/blog/california-is-a-few-phone-calls-away-from-100-renewable-energy>

**Woods-Robinson, R.,** (2017). *Cycle for Science Central Valley Blog*. Cycle for Science webpage. <http://cycleforscience.org/cv-blog>

<https://www.sierraclub.org/san-francisco-bay/blog/2017/03/so-you-re-fired-now-what>

**Woods-Robinson, R.** (2017). *So, you're fired up!? Now what?* BEREC blog, Sierra Club blog. <https://www.sierraclub.org/san-francisco-bay/blog/2017/03/so-you-re-fired-now-what>

**Woods-Robinson, R.,** Case, E. (2015). *Cycle for Science*, Department of Energy's, "Breaking Energy" Blog. <https://breakingenergy.com/tag/cycle-for-science/>

**Woods-Robinson, R.,** Case, E. (2015). *Cycle for Science xUSA Blog*. Cycle for Science webpage. <http://cycleforscience.org/weekly-updates>

## PRESENTATIONS AND LECTURES

### ORAL PRESENTATIONS

**Woods-Robinson, R.** (2023, Apr. 11). *Forbidden Optical Transitions—A New Design Metric for Transparent Conductors*. Oral presentation at the Materials Research Society (MRS) Spring Meeting, 2023, San Francisco, CA. [upcoming]

**Woods-Robinson, R.** (2022, Dec. 22). *Solar materials discovery: From computer predictions, to the lab, to the circular economy*. Virtual departmental seminar at National Renewable Energy Laboratory.

**Woods-Robinson, R.** and Horton, M. (2022, Aug. 15). [\*Alchemy in the 21<sup>st</sup> Century: New materials to combat the energy crisis\*](#). Virtual public lecture as part of Science at Cal's "Midday Science Café" seminar series. Berkeley, CA.

**Woods-Robinson, R.** (2022, July 6). *A method to computationally screen for tunability in PV materials*. Virtual oral presentation and discussion at the Emerging inorganic materials in thin-film photovoltaics Faraday Discussion. Bath, United Kingdom.

**Woods-Robinson, R.** (2022, June 23). *Step into a solar cell: a roadmap of the material and societal challenges to achieving a solar-powered world*. Invited plenary public lecture at the 2022 Latsis Symposium on Earth-Abundant Materials for Future Photovoltaics (SeeFuturePV). Lausanne, Switzerland.

**Woods-Robinson, R.** (2022, June 23). *Bridging the computational-experimental divide to design new p-type transparent conductors for solar energy*. Invited oral presentation at the 2022 Latsis Symposium on Earth-Abundant Materials for Future Photovoltaics (SeeFuturePV). Lausanne, Switzerland.

**Woods-Robinson, R.** (2022, May 10). *Lessons Learned in Combining Computational and Experimental Materials Discovery—A P-Type Transparent Conductor Case Study*. Oral presentation at the Materials Research Society (MRS) Spring Meeting, 2022, Honolulu, HI.

**Woods-Robinson, R.** (2022, Apr. 21). *Combining Computation and Experiment to Design Transparent Contacts for Photovoltaics*. Invited seminar at First Solar, Santa Clara, CA.

**Woods-Robinson, R.** (2022, Feb. 24). *Combining Computation and Experiment to Discover Transparent Contacts for Photovoltaics*. Departmental seminar at the Materials Science and Engineering Seminar Series, Berkeley, CA.

**Woods-Robinson, R.**, et al. (2020, June 15). *Evaluating materials design parameters of hole-selective contacts in silicon solar cells, and a nickel oxide case study*. Virtual oral presentation at the IEEE 47<sup>th</sup> Photovoltaics Specialists' Conference (PVSC) 2020. Various locations.

**Woods-Robinson, R.** (2020, Apr. 18). [\*Solar Searching: Clever Contacts to Combat Climate Change\*](#). Invited webinar at a TED@Home based in Oxford, UK.

**Woods-Robinson, R.** (2020, Mar. 3). *Synthesis and characterization of metastable Zn-Zr-N*. Oral presentation at the American Physical Society (APS) March Meeting, 2020. Denver, CO. [cancelled due to COVID-19]



**Woods-Robinson, R.** (2019, Sep. 13). *Computation-Informed Search for p-type Transparent Semiconductors*. Invited seminar at MESA+ Institute, University of Twente, Enschede, Netherlands.

**Woods-Robinson, R.** (2019, Aug. 23). *Computation-Informed Search for p-type Transparent Semiconductors*. Invited seminar at MARVEL Seminar Series, Ecole Polytechnique Fédérale de Lausanne (EPFL), Lausanne, Switzerland.

**Woods-Robinson, R.** (2019, May 30). *Leveraging high-throughput computation and combinatorial synthesis to predict p-type transparent chalcogenides*. Oral presentation at the European Materials Research Society (e-MRS) Spring Meeting, 2019, Nice, France.

**Woods-Robinson, R.** (2019, Jan. 11). *How can the Materials Project database be useful for PV experimentalists?* Invited seminar at the PV-Lab at École Polytechnique Fédérale de Lausanne (EPFL), Neuchâtel, Switzerland.

**Woods-Robinson, R.,** Dwaraknath, S., Broberg, D., Zakutayev, A., Persson, K. (2018, Nov. 26). *The Search for p-Type Transparent Conducting Chalcogenides*. Oral presentation at the Materials Research Society (MRS) Fall Meeting, 2018, Boston, MA.

**Woods-Robinson, R.,** Dwaraknath, S., Broberg, D., Zakutayev, A., Persson, K. (2018, Sep. 11). *High throughput computational exploration of multinary chalcogenides as p-type transparent semiconductors*. Oral presentation at the 21st International Conference on Ternary and Multinary Compounds (ICTMC-21), Boulder, CO.

**Woods-Robinson, R.** (2018, Jun. 15). *P-type transparent conductor Cu-Zn-S: structural considerations and photovoltaic applications*. Invited oral presentation at the 7<sup>th</sup> World Conference on Photovoltaic Energy Conversion (WCPEC), Waikoloa, HI.

**Woods-Robinson, R.** (2018, Apr. 4). *High Throughput Screening of P-Type Transparent Chalcogenide Candidates*. Oral presentation at the Materials Research Society (MRS) Spring Meeting, 2018, Phoenix, AZ.

**Woods-Robinson, R.,** Case, E. (2016, Jul. 14). *Cycle for Science: Grizzlies, Crowdfunding, and STEM, OH MY! A bicycle journey across America and into science classrooms*. Invited seminar at the Lawrence Berkeley National Laboratory (LBNL) Undergraduate Internship Programs (SULI, CCI, BLUR, VFP Student, BLUFF Student) Brown Bag Meeting, Berkeley, CA.

**Woods-Robinson, R.,** Case, E. (2016, Apr. 18). *Cycle for Science: A bicycle journey across America and into science classrooms*. Invited seminar at the All QESST Video Conference, 2016, webinar.

**Woods-Robinson, R.,** Cooper, J., Xu, X., Ager III, J.W. (2016, Apr. 5). *Copper-Alloyed Zinc Sulfide: Understanding structure and conductivity of an earth abundant, room temperature processed p-type transparent conductor*. Invited seminar at the National Renewable Energy Laboratory, Golden, CO.

**Woods-Robinson, R.,** Cooper, J., Xu, X., Ager III, J.W. (2016, Mar. 31). *Copper-Alloyed Zinc Sulfide: Understanding structure and conductivity of an earth abundant, room temperature processed p-type transparent conductor*. Oral presentation at the Materials Research Society (MRS) Spring Meeting, 2016, Phoenix, AZ.

**Woods-Robinson, R.,** Case, E. (2016, Mar. 28, Mar. 30). *Cycle for Science: Grizzlies, Crowdfunding, and STEM, OH MY! A bicycle journey across America and into science classrooms*. Oral presentation at the Materials Research Society (MRS) Spring Meeting, 2016, Phoenix, AZ.

**Woods-Robinson, R.,** Case, E. (2016, Mar. 3). *Cycle for Science: An Adventure into Crowdfunded Science Education*. Invited seminar at Cornell Mechanical & Aerospace Engineering SiGMA Seminar, Ithaca, NY.

**Woods-Robinson, R.,** Xu, X., Ager III, J.W. (2016, Feb. 22). *Copper-Alloyed Zinc Sulfide: An earth abundant, room temperature processed p-type transparent conductor for photovoltaic applications*. Invited seminar at EMPA, Zurich, Switzerland.

**Woods-Robinson, R.,** Xu, X., Ager III, J.W. (2016, Feb. 15). *Copper-Alloyed Zinc Sulfide: An earth abundant, room temperature processed p-type transparent conductor for photovoltaic applications*. Invited seminar at the Laboratory of Semiconductor Materials (LMSC), Ecole Polytechnique Fédérale de Lausanne (EPFL), Lausanne, Switzerland.

**Woods-Robinson, R.;** Cooper, J., Xu, X., Ager III, J.W. (2015, Apr. 9). *Copper-Alloyed Zinc Sulfide: A Room Temperature Processed p-type Transparent Material with Record Conductivity*. Oral presentation at the Materials Research Society (MRS) Spring Meeting, 2015. San Francisco, CA.

**Woods-Robinson, R.;** Faghaninia, A., Cooper, J.K., Pham, H.H., Lo, C.C., Wang, L.-W., Sharp, I.D., Ager III, J.W. (2015, Mar. 4). *Carrier scattering mechanisms in p-type transparent copper-alloyed ZnS*. Oral presentation at the American Physical Society (APS) March Meeting, 2015. San Antonio, TX.

**Woods-Robinson, R.** (2014, Feb. 12). *Low-Temperature Thermophysical Properties of Lunar Soil*. Oral presentation at the Diviner Lunar Radiometer Experiment Team Meeting, Honolulu, HI.

**Woods-Robinson, R.** (2013, Aug. 12). *Are Geothermal Heat Pumps Really “Carbon Neutral”? A comprehensive Life Cycle Analysis (LCA) to determine the Global Warming Potential (GWP) of the Deep Insulated Single Hole (DISH) Ground Source Heat Pump (GSHP)*. Oral presentation at the Energy Geotechnics REU Presentation Session, Madison, WI.

## POSTER PRESENTATIONS

**Woods-Robinson, R.** (2023, Feb 28). *The CO2 Impact of a PhD in Solar Materials*. Poster presentation at the Photovoltaic Reliability Workshop (PVRW), 2023, Golden, CO.

**Woods-Robinson, R.** (2022, May 9). *The CO2 Impact of Materials Science Research*. Poster presentation at the Materials Research Society (MRS) Spring Meeting, 2022, Honolulu, HI.

**Woods-Robinson, R.** (2021, Feb. 10). *Silicon solar cells: illuminating barriers from the nano-scale to the "scientist-scale."* Virtual poster presentation at the 2021 Berkeley Energy and Resources Collaborative Energy Summit, Berkeley, CA. (virtual)

**Woods-Robinson, R.** (2020, July 30). [\*The case for contacts: enabling high efficiency thin film solar cells\*](#). Virtual poster presentation at the 2020 virtual Materials Project Workshop. Berkeley, CA.

**Woods-Robinson, R.** (2020, Feb. 6). *Cu-Zn-S: A new earth-abundant back contact for high efficiency CdTe solar cells?* Poster presentation at the Berkeley Energy and Resources Collaborative Energy Summit, Berkeley, CA.

**Woods-Robinson, R.** (2018, Jul. 11). *Combinatorial Investigation into the Phase Space of P-Type Transparent Cu-Zn-S.* Poster presentation at the 7<sup>th</sup> Annual International School for Materials for Energy and Sustainability (ISMES VII), Erice, Italy.

**Woods-Robinson, R.,** Case, E. (2018, Apr. 4-5). *Cycle for Science: Teaching Interactive, Approachable STEM Across America via Bicycle.* Poster presentation and demo at the Outreach Session of the Materials Research Society (MRS) Spring Meeting, 2018, Phoenix, AZ.

**Woods-Robinson, R.** (2018, Apr. 3). *Combinatorial Investigation into the Phase Space of P-Type Transparent Cu-Zn-S.* Poster presentation at the Materials Research Society (MRS) Spring Meeting, 2018, Phoenix, AZ.

Heyer, H., **Woods-Robinson, R.,** Case, E. (2018, Feb. 22). *Cycle for Science: Teaching Interactive, Approachable STEM Across America via Bicycle.* Poster presentation at the Berkeley Energy and Resources Collaborative (BERC) 2018 Energy Summit, Berkeley, CA.

**Woods-Robinson, R.,** Case, E. (2017, Dec. 15). *Cycle for Science: An informal outreach program connecting K-12 students with renewable energy and physics through miniature 3D-printed, solar-powered bicycles.* Poster presentation at the 2017 American Geophysical Union (AGU) Fall Meeting, New Orleans, LA.

**Woods-Robinson, R.,** Siegler, M., Paige, D. A. (2016, Dec. 13). *Developing a New Thermophysical Model for Lunar Regolith Soil at Low Temperatures.* Poster presentation at the 2016 American Geophysical Union (AGU) Fall Meeting, San Francisco, CA.

**Woods-Robinson, R.,** Xu, X., Ager, J.W. (2016, May 31). *Cu-Zn-S Materials for Photovoltaics.* Poster presentation at the 2016 C3E Women in Clean Energy Symposium, 2016, Stanford, CA.

**Woods-Robinson, R.,** Xu, X., Ager, J.W. (2015, Oct. 19). *Understanding structure and conductivity in Cu-Zn-S: a low-temperature synthesized p-type transparent conductor.* Poster presentation at the 2015 Bi-annual Bay Area Photovoltaic Consortium Fall Meeting, Berkeley, CA.

**Woods-Robinson, R.,** Xu, X., Ager, J.W. (2015, Oct. 8). *The Cu-Zn-S Phase Space: Unlocking the mysteries of promising p-type transparent conductors at SSRL.* Poster presentation at the SSRL / LCLS Annual Users' Meeting & Workshop 2015, Menlo Park, CA.

**Woods-Robinson, R.,** Ager, J.W. (2014, Oct. 16). *Copper-alloyed ZnS as a p-type transparent conductor: exploring material properties and PV applications.* Poster presentation at the Berkeley Energy and Resources Collaborative Energy Summit, Berkeley, CA.

**Woods-Robinson, R.,** Ager, J.W. (2014, Oct. 6). *Copper-alloyed ZnS as a p-type transparent conductor: exploring material properties and PV applications.* Poster presentation at the 2014 Bi-annual Bay Area Photovoltaic Consortium Fall Meeting, Berkeley, CA.

**Woods-Robinson, R.,** Ager, J.W. (2014, May 12). *Deposition strategies for p-type transparent conducting materials.* Poster presentation at the 2014 Bi-annual Bay Area Photovoltaic Consortium Spring Meeting, Stanford, CA.

**Woods-Robinson, R.,** Paige, D.A. (2014, Mar. 18). *Low Temperature Thermal Properties of Lunar Soil*. Poster presentation at the 45<sup>th</sup> Lunar and Planetary Science Conference (LPSC), The Woodlands, TX.

**Woods-Robinson, R.,** Tinjum, J. (2014, Mar. 8). *Life Cycle Assessment of Ground Source Heat Pumps and Comparison with Conventional HVAC Methods*. Poster presentation at the APS Third Conference on the Physics of Sustainable Energy, UC Berkeley.

**Woods-Robinson, R.** (2013, Oct. 29). *Life Cycle Assessment of a Deep Insulated Single Hole (DISH) Ground Source Heat Pump and Comparison with Conventional Heating, Ventilation and Cooling (HVAC) Methods*. Poster presentation at the Conference of Research Experiences for Undergraduates Student Scholarship, Arlington, VA.

## TEACHING, LECTURING, AND FACILITATING

Contestant and Speaker, 2021 Berkeley Grad Slam Competition: *Solar Searching: Clever Contacts to Combat Climate Change* (2021, Apr. 14). Virtual.

Facilitator, American Ceramics Society (ACerS) Winter Workshop: *Culture and Support Systems* (2021, Jan. 28). Virtual.

Moderator, Materials Research Society Fall Meeting: *Navigating, Surviving, and Thriving in the Challenging Landscape of Academia*. (2020, Nov. 3). Virtually from Boston, MA. [Link](#).

Panelist, UC Berkeley Beyond Academia: *What I Wish I Did In Grad School (WIWIDIGS)*. (2020, Sep. 10). Virtually from Berkeley, CA. YouTube link: <https://www.youtube.com/watch?v=WoDPUHT-jQg>

Guest lecturer and instructor, 2020 virtual Fifth Annual Materials Project Workshop: *Exploring New Alloy Systems with Pymatgen* (2020, July 30). Virtually from Berkeley, CA.

Lesson material: [https://workshop.materialsproject.org/lessons/o6\\_new\\_systems/](https://workshop.materialsproject.org/lessons/o6_new_systems/).

YouTube link: <https://www.youtube.com/watch?v=AHVNzqBJuts>.

Panelist, Lawrence Berkeley National Laboratory Interns: *Graduate Student Panel*. (2020, Apr. 3). Virtually from Berkeley, CA.

Guest lecturer and moderator, UC Berkeley Spring 2020 Decal course “Environmental Justice and Solar Energy in California”: *Solar energy, community engagement, and sustainable adventure*. (2020, Mar. 6). Berkeley, CA.

Guest lecturer and moderator, UC Berkeley Spring 2019 Decal course “Environmental Justice and Solar Energy in California”: *Solar energy, community engagement, and sustainable adventure*. (2019, Jan. 31). Berkeley, CA.

Guest lecturer and moderator, UC Berkeley Fall 2018 Decal course “Sustainable Energy for a Greener Tomorrow”: *A Tale of Solar Energy, Community Engagement and Sustainable Adventure*. (2018, Oct. 16). Berkeley, CA.

Guest lecturer and moderator, UC Berkeley Spring 2018 Decal course “Environmental Justice and Solar Energy in California”: *Cycling for Science, solar energy frontiers, and the ethical responsibilities of outsiders in community STEM outreach*. (2018, Feb. 14). Berkeley, CA.

Instructor, lecturer and moderator, Wild Rockies Field Institute (WRFI) and University of Montana (UM)'s 2017 “Cycle the Rockies” course, multiple lectures and discussions (Summer 2017) (see above)

Guest lecturer, UC Berkeley MAT SCI 242 “Advanced Characterization Techniques”: *Ion Eyes – Peering into Materials using Ion Beam Analysis Techniques*. (2017, Mar. 7). Berkeley, CA.

## AWARDS AND PRESS

### HONORS AND AWARDS

AS&T Excellence in Research (ASTER) Award (UC Berkeley Departmental Award)	June 2021
Ross N. Tucker Award	Mar. 2021
Berkeley Energy and Resources (BERC) Summit Best Poster Award	Feb. 2021
UC Berkeley “Grad Slam” Competition Semifinalist	Feb. 2021
2020 Wild Rockies Field Institute Photo Contest Winner	Oct. 2020
IEEE PVSC 47 Student Presentation Award Finalist	Apr. 2020
UC Berkeley Dissertation Fellowship (alternate)	Apr. 2020
American Chemical Society’s Chemical Reviews Honorarium Recipient	Mar. 2020
UC Berkeley “Grad Slam” Competition Semifinalist (postponed due to COVID)	Feb. 2020
American Geophysical Union (AGU) \$5k Centennial Grant (for Cycle for Science)	Sep. 2019
Student and Postdoc Team Science Award, 2019 Energy Frontier Research Center (EFRC) PI Meeting	July 2019
European Materials Research Society (e-MRS) Graduate Student Award	May 2019
David T. Attwood Award for AS&T Excellence in Service (UC Berkeley Departmental Award)	May 2019
ThinkSwiss Research Scholarship 2019 Awardee	Feb. 2019
First Place Group Presentation at ISMES VII Green Design Competition	July 2018
Full Scholarship to the 7 <sup>th</sup> Annual International School for Materials for Energy and Sustainability (ISMES VII)	July 2018
Best Student Paper Award at the Photovoltaics Specialist Conference (PVSC) 2018	June 2018
2018 Spring Materials Research Society (MRS) Best Poster Award Winner	Apr. 2018
Quantum Energy and Sustainable Solar Technologies (QESST) Outstanding Outreach Competition winner (Cycle for Science)	Mar. 2017
National Science Foundation (NSF) Graduate Research Fellowships Program (GRFP)	2016 – 2021
UC Berkeley Chancellor’s Fellowship	2016 – 2018
2016 SHIFT Emerging Leaders Program inaugural member	Oct. 2016
2016 SHIFT (Shaping How we Invest For Tomorrow) Youth Leadership Award Finalist	Aug. 2016
Phi Beta Kappa	2013
Magna Cum Laude, UCLA	Dec. 2013
Research Experiences for Undergraduates Student Scholarship Award	2013
UCLA Gold Shield Scholarship	2010 – 2013
UCLA Alumni Scholarship	2009 – 2013
Dean’s Honors List, UCLA	5 quarters, 2010 – 2013
Kenny Burrell Jazz Scholarship	2009 – 2011

### NEWS AND PRESS

- Feb. 2020 and Feb 2021, Berkeley Graduate Division, “2020 Berkeley Grad Slam Competition”, <https://grad.berkeley.edu/professional-development/grad-slam/>
- June 18, 2020, LA Progressive, <https://www.laprogressive.com/surviving-shelter-in-place/>
- June 18, 2020, Berkeley Blog, <https://blogs.berkeley.edu/2020/06/18/a-stay-at-home-scientists-guide-to-surviving-shelter-in-place/>

- Apr. 15 2020, NREL News, “NREL Researchers Review Promising Class of New Materials for Energy Applications”, <https://www.nrel.gov/news/program/2020/nrel-researchers-review-promising-class-of-new-materials-for-energy-applications.html>
- Nov. 20, 2019, EPFL Magazine, “A bike trip to teach about solar energy and science”, <https://epfl.magnum3.ch/article/a-bike-trip-to-teach-about-solar-energy-and-science/316>
- Oct. 16, 2019, Daily Bruin, “Alumnae embark on bike rides geared toward encouraging female interest in science”, <https://dailybruin.com/2019/10/17/alumnae-embark-on-bike-rides-geared-toward-encouraging-female-interest-in-science>
- Sep. 13, 2019, UTwente Today, “We want to show that science is cool”, <https://www.utoday.nl/news/67356/we-want-to-show-that-science-is-cool>
- Jan. 1, 2019, STEMinist Chronicles, “Rachel Woods-Robinson”, <https://stemistchronicles.com/rachel-woods-robinson/>
- June 15, 2017, 350 Bay Area, “Cycle the Rockies: Energy & Climate Change in Montana 6/15”, [http://350bayarea.nationbuilder.com/cycle\\_montana\\_170615](http://350bayarea.nationbuilder.com/cycle_montana_170615)
- Mar. 30, 2016, Materials Research Society, “MRS TV: Cycling for Science”, <https://www.youtube.com/watch?v=XPLYoMkawuE>
- Oct. 20, 2015, Today at Berkeley Lab, “Cycling for Science: Lab Researcher Recounts her Cross-Country Trek”, <https://today.lbl.gov/cycling-for-science-lab-researcher-recounts-her-cross-country-trek/>
- Oct. 8, 2015, Materials Research Society, “Cycle for Science”, <https://link.springer.com/article/10.1557/mrs.2015.250>
- Oct. 2015, American Physical Society, “Cycling Across America ... For Science!”, <https://www.aps.org/publications/apsnews/201510/cycling-science.cfm>
- Sep. 9, 2015, HeatSpring Magazine, “Solar Women Summer Series: Cycle For Science”, <https://blog.heatspring.com/solar-women-summer-series-cycle-for-science/>
- July 15, 2015, Nextgov, “Encouraging STEM studies, one mile at a time”, <https://www.nextgov.com/emerging-tech/2015/07/video-bike-ride-across-country-science/17868/>
- July 8, 2015, U.S. Department of Energy, “A Bike Ride Across the Country for Science”, <https://www.youtube.com/watch?v=TEQXPUM4f4>
- June 12, 2015, Iowa Falls Times Citizen, “Cycling for science”, [http://www.timescitizen.com/news/cycling-for-science/article\\_22c0557c-10fe-11e5-839e-6b1fd687470f.html](http://www.timescitizen.com/news/cycling-for-science/article_22c0557c-10fe-11e5-839e-6b1fd687470f.html)
- June 3, 2015, U.S. Department of Energy, “Mountains. And Teachers. And a Bear. Oh My!”, <https://breakingenergy.com/2015/06/03/mountains-and-teachers-and-a-bear-oh-my/>
- May 7, 2015. NBC Nightly News. “What Two Women on a Cross Country Bike Ride Want Girls to Know.” <https://www.nbcnews.com/nightly-news/video/what-two-women-on-a-cross-country-bike-ride-want-girls-to-know-441747523795>
- Mar. 9, 2015. DOGO News. “Cycle for Science: A Cross Country Adventure with a Mission”, <https://www.dogonews.com/2015/3/9/cycle-for-science-a-cross-country-adventure-with-a-mission>
- Mar. 5, 2015. Christian Science Monitor. “Biking across America to teach pop-up science classes.” <https://www.csmonitor.com/World/Making-a-difference/Change-Agent/2015/0304/Biking-across-America-to-teach-pop-up-science-classes>
- Feb. 2, 2015. Capital Science Communicators, “Davis Reporter Trades Byline for Bicycle to Teach Kids Physics on Transcontinental Ride”, <https://capscicomm.org/2015/02/20/davis-reporter-trades-byline-for-bicycle-to-teach-kids-physics-on-transcontinental-ride/>
- May 27, 2013. Daily Bruin. “Pedaling to Power Ecochella”, <https://dailybruin.com/2013/05/27/video-pedaling-to-power-ecochella>
- May 24, 2013. Daily Bruin. “Ecochella channels music, energy from within”, <http://165.227.25.233/2013/05/24/ecochella-channels-music-energy-from-within/>

## OUTREACH, ADVOCACY, AND SERVICE

### SELECTED OUTREACH AND SERVICE

#### Co-Founder, Co-Director, Teacher, Bicyclist

*Cycle for Science*

**Jan. 2015 – Present**

*Multiple Locations Internationally*

- Founded an international STEM outreach organization, and organized and fundraised six trips (two postponed due to COVID-19) with eight co-teachers, reached >5,000 students aged 5–18.
- Bicycled across the United States, from San Francisco to New York City, and stopped at middle schools and summer camps along the way to teach dozens of hands-on lessons about physics and renewable energy (Apr. – July 2015).
- Bicycled through the California Central Valley over the course of a week, teaching at middle schools and museums about renewable energy (Mar. 2017).
- Bicycled across the Netherlands over the course of a week, teaching hands-on lessons at high schools where students made their own dye-sensitized solar cells (Sep. 2019).
- Invented, designed, prototyped, 3D-printed, and assembled miniature solar powered bicycles, called “Sol Cycles,” to use as teaching tools.
- Project was covered by NBC Nightly News and the US Department of Energy, among other news outlets.
- Created and currently manages Cycle for Science’s website: <http://cycleforscience.org>

#### “Cycle the Rockies” Instructor and Lecturer

*Wild Rockies Field Institute (WRFI),  
University of Montana (UM)*

**July – Aug. 2017; June – July 2023**

*Multiple Locations, MT*

- Co-instructor for month-long undergraduate-level immersive experiential learning field course “Cycle the Rockies,” taught via a bicycle trip across Montana, focusing on energy and climate change in the American West. Course is accredited through UM as Environmental Studies 395: Field Studies of Climate Change in Montana and Natural Resource Science & Management 321: Field Studies of Energy Systems in Montana.
- Prepared course reader with mixed media content (scientific articles, newspaper articles, technical reports, opinion pieces, etc.).
- Prepared lectures and interactive activities specific to solar energy technology, wind energy, biofuels, geothermal, hydroelectric, coal and other fossil fuels, energy regulation, and climate change policy.
- Arranging visits with a coal mine, wind farm, battery factory, policy members, ranchers, community members, and other Montanans intertwined with energy and climate issues along the route.
- Designing and grading student assignments, assisting with blog assignments.
- Responsible for guiding students hundreds of miles via bicycle, ensuring safety, performing first aid, performing bicycle maintenance, camping/cooking responsibilities, etc.

#### BERC-E and AS&T Liaison

*Berkeley Energy and Resources Collaborative (BERC)*

**Jan. 2017 – Feb. 2019**

*Berkeley, CA*

- Co-chair of BERC-Engineering (BERC-E), a group of graduate students from various engineering and science departments who meet weekly to discuss a variety of energy topics, recent journal articles, our own research, amongst ourselves or with experts from the Berkeley community.
- BERC liaison for the department of Applied Science and Technology at UC Berkeley.



- Initiated a collaboration with the Union of Concerned Science (UCS) and selected to participate in their Science Network campus pilot project.

**Science Policy Advocate****Jan. 2020 – Present***Science Policy Group, UC Berkeley**Berkeley, CA*

- Currently (Feb. 2021) spearheading a team writing a policy proposal about a national program to connect practicing scientists with K-12 classrooms in the US.
- Member of advocacy team, which goes to the California State Capitol to meet with lawmakers and advocate for science-based policies such as electric vehicle and roof-top solar accessibility.
- Advocated at Sacramento Capitol Hill on January 31, 2020. Wrote a policy one-pager and shared scientists' and educators' feedback on the new climate education bill AB-1922 with five assembly members' offices.

**Founder and Executive Director****Jan. – Dec. 2013***Ecochella Music and Sustainability Festival**Los Angeles, CA*

- Founded and directed Ecochella, a now annual student-run concert powered entirely by students on bicycle generators, in order to educate and inspire UCLA students about unconventional uses of renewable energy and sustainable design.
- Directed all logistics, public relations, and fundraising, led a planning team of fifty students, managed subcommittees, trained the next year's leadership team.
- Built AC and DC bicycle generators and organized generator-building competition.
- Currently (Dec. 2013 – Present) a consultant for Ecochella, which has been renamed "Coastalong Festival." Website: <http://coastalongfestival.squarespace.com>

**ADDITIONAL OUTREACH AND SERVICE****Climate Action Collaborator****Sept. 2022***Decarbon App*

- Led a climate action initiative through the Decarbon, an app to estimate personal carbon footprint

**Session Chair****Spring 2022***Materials Research Society (MRS)*

- DSo4: Recent Advances in Data-Driven Discovery of Materials for Energy Conversion and Storage
- ENo3: Emerging Inorganic Semiconductors for Solar Energy and Fuels

**Event Coordinator and Subcommittee Member****Fall 2020 – Spring 2021***Student Engagement Subcommittee, Materials Research Society (MRS)**Virtual*

- Co-organized a three-part workshop on mental wellbeing, support, and advocacy in academia for the Fall/Spring MRS Virtual Workshop.

**"STEM Professional" Science Fair Judge****Spring 2021***Oakland Science and Engineering Fair (OSEF)**Virtual*

- Participate in judge training, evaluate dozens of projects, meet one-on-one with students for mentorship, to give feedback, and give presentations about my research.

**NREL Mentor****Fall 2020 – Spring 2021**

**NREL Women's Network Mentoring Working Group** *Virtual*

- Mentoring a post-baccalaureate researcher as part of NREL's "Creating Connections" pilot program.

**Subcommittee Member** **Fall 2020** **Spring 2021**  
*Women in PV and Diversity Subcommittee, IEEE Photovoltaic Specialist Conference (PVSC)* *Virtual*

- Participates on the monthly diversity planning committee for the 2021 virtual conference.
- Spearheading and coordinating an event focusing on academic wellness and mental health.

**Team Lead** **Fall 2020** **Spring 2021**  
*UC Berkeley Applied Science and Technology Recruitment Team* *Virtual*

- Preparing and giving presentations to spread awareness about the Applied Science and Technology Graduate Group.

**Judge, Climate Change Essay Competition** **Jul. 2019** **Sep. 2019**  
*The Economist, Open Future* *London, UK*

- Selected as the renewable energy expert judge on The Economist's youth climate change essay competition.
- Read through hundreds of essays from participants worldwide, narrowed a list of finalists, and carefully critiqued and selected the winning essay.

**Lead Author and Facility User** **Nov. 2014** **Sep. 2021**  
*Stanford Synchrotron Radiation Lightsource (SSRL)* *Menlo Park, CA*

- Lead author and lead coordinator of three accepted and highly rated user proposals:
  - #5549 Combinatorial and in-situ x-ray characterization of new materials for energy applications
  - #4715 High throughput x-ray analysis on new semiconductors for solar energy conversion applications
  - #4335 Structural analysis of high-performance p-type transparent conductors
- Collaborator on three proposals: #9705 Joint Center for Artificial Photosynthesis, #4275 Improving Photovoltaic Materials through X-Ray Diffraction Techniques, #4238 Tracking exciton and free carrier dynamics in organic solar cells using XAS in a pump-probe setup.
- Researcher at over ten synchrotron beam time sessions on beam lines 1-5, 11-3, 11-2, 1-2, 7-2, and 10-1.

**BERC Academic Mentor** **Sep. 2016** **Sep. 2021**  
*Berkeley Energy and Resources Collaborative (BERC)* *Berkeley, CA*

- Mentors undergraduate students interested in energy research and academic concerns.
- Monthly to quarterly meetings with four total undergraduate students

**Science Education Mentor** **Nov. 2014** **Present**  
*Bay Area Scientists in Schools (BASIS), Community Resources for Science (CRS)* *Berkeley, CA*

- Teaches one-hour, hands-on Next Generation Science Standard lessons on renewable energy and water to Berkeley and Oakland classrooms in low-income neighborhoods, ages 8-13.

**Workshop Coordinator** **Nov. 2017** **May 2018**  
*Earth Action Initiative (EIA)* *Berkeley, CA*

- Coordinator and co-leader of a workshop on California Climate Policy at the first annual Earth Action Initiative (EIA) environmental conference entitled "Cleaning Up Our Backyard: How to Influence Our State and Local Climate Policy."

- Help the founding members, a group of fellow graduate students at UC Berkeley, with facilitating event planning, organization creation, and community organizing strategies.
- Organizing follow-up op-ed and memo-writing workshops with the Union of Concerned Scientists.
- Wrote an op-ed about California State Assembly bill SB-100.

**Symposium Assistant****April 2018***Materials Research Society Spring Meeting 2018**Phoenix, AZ*

- Graduate student position to coordinate with symposium organizers to post session information, oversee speakers, keep time, record attendance, resolve audio/visual problems.

**Design Coordinator****Fall 2018 Spring 2019***Computational Materials at Berkeley*

- Founding member and design coordinator of UC Berkeley's first Computational Materials Science graduate student organization.

**Programming Assistant****Aug. 11-12, 2018***The Third Annual Materials Project Workshop*

- Assist and help attendees of the workshop with python coding and pymatgen infrastructure during and between lectures.

**Science Education Mentor****Jan. Mar. 2015, Feb. Apr. 2017***"Be a Scientist," Community Resources for Science (CRS)**Berkeley, CA*

- Mentored in the third year of the "Be a Scientist" program, giving guidance to middle school students in brainstorming, designing, carrying out, and analyzing their own science projects (1 lesson/week).

**Clean Energy Campaign Founding Director****Sep. 2012 Dec. 2013***Economy, Ecology & Equity (E3), UCLA**Los Angeles, CA*

- Started and ran campaign to spread awareness and advocate in LA city council about renewable energy and increase efficiency in pre-existing UCLA energy systems.
- Wrote grant proposals, facilitated decision making.
- Coordinated logistics of bringing energy generating dance floor to UCLA's 24-hour Dance Marathon, conducted research project about energy generation, the piezoelectric effect and practical use of this technology.

**Academic Mentor****Sep. 2009 June 2013***Alumni Scholars Club, UCLA**Los Angeles, CA*

- Mentored three undergraduate students about general academic information.

**Jazz Trombonist****Sep. 2009 June 2013***UCLA Music Ensembles**Los Angeles, CA*

- Rehearsed weekly and performed in the UCLA Jazz Orchestra, UCLA Latin Jazz Orchestra, the UCLA Large Ensemble (LE), and various Jazz Combos.

**Trombonist****Mar. 2010 June 2013***"Free Food" Music Collective**Los Angeles, CA*

- Performed with and composed for eight-piece Los Angeles based hip hop/jazz fusion band.
- Played benefit shows across Los Angeles, contributed to the release of one album and two music videos.

**Energy Management Action Research Team Member** Jan. 2012 June 2012  
*Institute for the Environment (IoES), UCLA* Los Angeles, CA

- Spearheaded student and community education about renewable energy.
- Conducted a campus light monitoring study in the Engineering IV building at UCLA.
- Constructed a 60-Watt solar panel for educational use on the UCLA campus and brought solar powered charging stations to the UCLA campus (completed June 2013).

**Waste Management Action Research Team Member** Jan. 2011 June 2011  
*IoES, UCLA* Los Angeles, CA

- Initiated converting the UCLA campus to single-stream recycling, surveyed campus waste management, met with UCLA officials to plan implementation of new program.
- Designed and implemented a desk side recycling program in multiple UCLA buildings.

**Environmental Education Mentor** Sep. 2010 June 2011  
*Project Greenlight, Economy, Ecology & Equity (E3), UCLA* Los Angeles, CA

- Volunteered monthly with UCLA student-run organization to educate local elementary school children about sustainability and its significance in everyday life.
- Topics taught included energy efficiency, renewable energy, waste management and water conservation.

## PROFESSIONAL MEMBERSHIP

Dragonfly Mental Health Member	2021	Present
Institute of Electrical and Electronics Engineers (IEEE) Member	2020	Present
National Science Policy Network	2020	Present
Union of Concerned Scientist (UCS) Member	2017	Present
Materials Research Society (MRS) Member	2015	Present
Society of Women Engineers (SWE) Member	2015	Present
Cycle for Science Member and Leader	2015	Present
Berkeley Energy and Resources Collaborative (BERC) Member	2014	Present
UCLA Alumni Association Lifetime Member	2013	Present
UC Berkeley Science Policy Group Member	2019	2021
Center for Next Generation Materials by Design (CBGMD) EFRC Member	2016	2019
American Geophysical Union (AGU) Member	2016	2018
American Physical Society (APS) Member	2014	2016
Bay Area Photovoltaic Consortium (BAPVC) Member	2014	2016
Solar Energy Research Institute for India and the United States (SERIUS)	2014	2016
NOLS Wilderness First Aid Certified	2014	2016
UC Berkeley CITRIS Invention Lab Member		2015
UCLA Alumni Association Member	2009	2013
UCLA Ecology, Economy and Equity (E3) Member and Leader	2009	2013

