Luisa Whittaker-Brooks **Department of Chemistry, University of Utah** *Email:* *luisa.whittaker@utah.edu* *website: www.whittakerteam.com*

EDUCATION AND TRAINING

- 2011-2014 Postdoctoral Scholar, Chemical Engineering, Princeton University
- 2009-2011 Ph.D. in Chemistry, University of Buffalo, NY
- 2007-2009 M.S in Chemistry, University of Buffalo, NY
- 2005-2007 M.S. Environmental Planning, University of Panama, Rep. of Panama
- 2001-2005 B.S. Chemistry, University of Panama, Rep. of Panama

RESEARCH AND PROFESSIONAL EXPERIENCE

- 2023-present Associate Editor, Science Advances
- 2021-present Associate Director, Utah Nanofab and Surface Analysis Center
- 2021-present Associate Professor, Department of Chemistry, University of Utah
- 2014-2021 Assistant Professor, Department of Chemistry, University of Utah
- 2011-2014 Postdoctoral Research Associate, Chemical Engineering, Princeton University
- 2007-2012 Graduate Research Assistant, State University of New York at Buffalo
- 2009-2010 Teaching Assistant, State University of New York at Buffalo
- 2004-2007 Chemistry Lecturer, St. Mary's High School, Republic of Panama

HONORS AND AWARDS

- 2024 Beckman Scholar Program Mentor, Beckman Foundation
- 2024 WCC Rising Star Award, Women Chemists Committee (WCC) American Chemical Society
- 2024 Slayton Evans Lectureship in Chemistry, UNC Chapel Hill
- 2023 Goll Lecture in Materials Science and Engineering, Northwestern University
- 2023 Outstanding Early-Career Investigator Award, Materials Research Society (MRS)
- 2023 Faculty Fellowship Program, Israel Jewish National Fund
- 2023 NOBCChE Lecture in Chemistry, UPenn
- 2022 Organizing committee, Kavli Frontiers of Science Symposia in Israel
- 2022 Journal of Materials Chemistry Lectureship, Top Candidate
- 2022 Editorial Advisory Board, *Journal of Materials Chemistry A*
- 2022 Presidential Scholar Award, University of Utah
- 2022 ACS Energy Letters Women Scientists at the Forefront of Energy Research
- 2021 Industrial & Engineering Chemistry Research class of Influential Researchers, ACS Axial
- 2021 Kavli Frontiers of Science Fellow, Kavli Foundation
- 2021 Camille Dreyfus Teacher-Scholar Award
- 2021 Alfred P. Sloan Research Fellow in Chemistry, Sloan Foundation
- 2020 W.W. Epstein Outstanding Educator Award, University of Utah
- 2020 Editorial Advisory Board, *ACS Applied Materials & Interfaces*
- 2020 Editorial Advisory Board, *ACS Omega*
- 2020 Scialog Fellow, Negative Emissions Science (NES) Initiative, Research Corporation for Science Advancement (RCSA)
- 2020 Early Career Faculty Advisor Board, *ChemNanoMat*
- 2019 Scialog Collaborative Innovation Awards, RCSA
- 2018 Early Career Award, Department of Energy (DOE)
- 2018 Talented 12, American Chemical Society (ACS)
- 2018 Cottrell Research Scholar, RCSA
- 2018 Emerging Investigator, *Journal of Materials Chemistry A*
- 2017 GERA Ovshinsky Sustainable Energy Fellow, American Physical Society (APS)
- 2017 Scialog Fellow, Energy Storage Technologies, RCSA

- 2017 Lloyd N. Ferguson Young Scientist Award for Excellence in Research, NOBCChE
- 2016 Young Leaders Award, The Minerals, Metals, and Materials Society (TMS)
- 2015 International Young Observer, International Union of Pure and Applied Chemistry (IUPAC)
- 2015 Marion Milligan Mason Fellow, American Association for the Advancement of Science
- 2014 Energy Award, Institute of Chemical Engineers (IChemE) Global Awards
- 2013 L'Oreal USA Fellowship for Women in Science, L'Oreal USA and AAAS
- 2011 Graduate Student MRS Gold Medal, Materials Research Society (MRS)
- 2011 Nottingham Prize, American Vacuum Society (AVS)
- 2010 Mark Diamond Research Fellowship, State University of New York at Buffalo
- 2007 Fulbright Fellowship, US. Department of State, Institute of International Education

DEPARTMENT AND UNIVERSITY SERVICE

- 2023-present Faculty hiring committee
- 2022-present COS Council
- 2021-present Technical support committee (co-chair)
- 2021-2022 Graduate education committee
- 2020-2021 Graduate admissions committee
- 2018-2021 Graduate recruiting committee
- 2018-present Mentor for the National Society of Black Scientists and Engineers (NBSE)
- 2018-present Academic advisor for SACNAS –University of Utah Chapter
- 2016-present Seminar and colloquium committee (Materials Division)
- 2016-present Mentor for the African American Doctoral Scholars Initiative (AADSI)
- 2016-2018 Technical support committee (X-ray)
- 2016-2017 Graduate admissions committee
- 2015-2016 Graduate education committee

PROFESSIONAL SERVICE

- Symposium organizer for the Materials Research Society (MRS) meeting (2015-present)
- Symposium organizer for OSA Advanced Photonic Congress (2020)
- Symposium organizer for APS and NOBCChE (2020)
- Service as a technical volunteer to the MRS (2014-present)
- Service as part of the international advisory panel for Materials Research Express (IOP Science)
- Reviewer for Nature Materials, JACS, J. Phys. Chem., Adv. Mater., and Chem. Sci.
- NSF, AFOSR, and DOE reviewer

TEACHING

- Fall 2023 CHEM 1225 General Chemistry Laboratory II
- Spring 2022-2024 CHEM 7130/3130 Solid State Chemistry
- Spring 2018-2023 CHEM 1221 Honors General Chemistry II
- Fall 2015-2018 CHEM 7130/3130 Solid State Chemistry
- Fall 2014-2016 CHEM 1211 Honors General Chemistry I

PUBLICATIONS (* corresponding author)

70. K. R. Hansen, C. E. McClure, M. A. Parker, Z. Xie, W. Nie, J. S. Colton, L. Whittaker-Brooks*. Stochastic charge-transfer excitons in 2D metal-halide perovskites. Accepted *ACS Energy Lett.*, 2024.

69. E. J. Miller, K. R. Hansen, L. Whittaker-Brooks*. Charge transport and ion kinetics in 1D TiS_2 structures are dependent on the introduction of selenium extrinsic atoms. Accepted *ACS Nanoscience Au*, 2024. https://doi.org/10.1021/acsnanoscienceau.3c00059

68. K. R. Hansen, J. S. Colton, L. Whittaker-Brooks*. Measuring the excitons binding energy: learning from a decade of measurements on halide perovskites and transition metal dichalcogenides. *Adv. Opt. Mater.*, 2024, 12, 2301659.

67. K. R. Hansen, C. Y. Wong, C. E. McClure[#], B. Romrell, L. Flannery, D. Powell, K. Garden, A. Berzansky, M. Eggleston, D. J. King, C. M. Shirley, M. C. Beard, W. Y. Nie, A. Schleife, J. S. Colton, L. Whittaker-Brooks*. Mechanistic origins of exciton properties in 2D perovskites: implications for exciton engineering. *Matter*, 2023, 6, 1-20. [#]**Undergraduate student.**

66. K. R. Hansen, B. Romrell, C. E. McClure[#], M. Eggleston, A. Berzansky, J. Lin, L. Whittaker-Brooks*, J. S. Colton. Ruddlesden−Popper perovskite alloys: Continuous and discontinuous tuning of the electronic structure. *J. Phys. Chem. C*, 2023, 19, 9344-9353. [#]**Undergraduate student.**

65. E. J. Miller and L. Whittaker-Brooks*. Precision intercalation chemistry: The next step for battery development?. Accepted *Matter*, 2023, 6, 1051-1053.

64. P. Baral, X. Zhang, K. Garden, N. Chakraborty, L. Shen, Z. Cao, X. Gong, L. Whittaker-Brooks, and H. Wang. Efficient and stable perovskite solar cells based on blade-coated $CH_3NH_3PbI_3$ thin films fabricated using "green" solvents under ambient conditions. *Org. Electron.*, 2023, 116, 106763.

63. X. Zhang, P. Baral, N. Chakraborty, K. Garden, L. Shen, S. N. Vijayaraghavan, Z. Cao, F. Yan, X. Gong, L.Whittaker-Brooks, H. Wang. Blade coating inverted perovskite solar cells with vacuum assisted nucleation based on bottom quasi-2D passivation. *Solar RRL*., 2023, 2200900.

62. J. Sun, J. Peng, W. Xue, T. Ring, L. Whittaker-Brooks, A. D. Pendergast, H. S. White, J. Zhu, D. Fraggedakis, J. Niu, T. Gao, and F. Wang. Lithium deposition mechanism on Si and Cu substrates in the carbonate electrolyte. *Energy Environ. Sci.*, 2022, **15**, 5284-5299.

61. L. Flannery, K. R. Hansen, J. Ogle, D. Powell, K. Garden, L. Whittaker-Brooks. Voltage bias stress effects and electronic stability of π-conjugated crosslinked tin halide perovskites. *ACS Appl. Energy. Mater.*, 2022, **5**, 14720-14731.

60. D. Powell, X. Zhang, C. Nwachukwu, E. J. Miller, K. R. Hansen, L. Flannery, J. Labram, A. Roberts, L. Whittaker-Brooks*. Establishing self-dopant design principles from structure-function relationships in self-n-doped perylene diimide organic semiconductors. *Adv. Mater.*, 2022, **42**, 2204656. (featured as the front cover)

59. N. S. Weliwatte, O. Simoska, D. Powell, M. Koh, M. Grattieri, L. Whittaker-Brooks, C. Korzeniewski, S. D. Minteer. Deconvoluting charge transfer mechanism in conducting redox polymer-based photobioelectrocatalytic systems. *J. Electrochem. Soc.*, 2022, **169**, 085501.

58. K. R. Hansen and L. Whittaker-Brooks*. Finding the FAIRness in perovskite photovoltaics research. *Matter*, 2022, 5, 2561-2464.

57. J. V. Handy, J. L. Andrews, S. Perez-Beltran, D. R. Powell, R. Albers, L. Whittaker-Brooks, N. Bhuvanesh, S. Banerjee. A "Li-Eye" view of diffusion pathways in a 2D intercalation material from topochemical single-crystal transformation. *ACS Energy Lett.*, 2022, **7**, 1960-1962.

56. D. Powell, Z. Rhodes, X. Zhang, E. J. Miller, M. Jonely, K. R. Hansen, C. Nwachukwu, A. Roberts, H. Wang, R. Noriega, S. D. Minteer, L. Whittaker-Brooks*. Photoactivation properties of self-n-doped perylene diimides: concentration-dependent radical and biradical formation. *ACS Materials Au*, 2022, **2**, 482-488.

55. D. Powell and L. Whittaker-Brooks*. Concepts and principles of self-n-doping in perylene diimide chromophores; applications in biochemistry, energy harvesting, energy storage, and catalysis. *Mater. Horiz.*, 2022, **9**, 2026-2052.

54. K. R. Hansen, E. McClure,# D. Powell, H.-C. Hsieh, L. Flannery, K. Garden, E. J. Miller, D. King, J. Colton, L. Whittaker-Brooks.* Low exciton binding energies and localized exciton-polaron states in 2D tin halide perovskites. *Adv. Opt. Mater*., 2022, 2102698. [#]**Undergraduate student.**

53. C. Hill*, J. Mendoza-Cortez*, J. M. Velazquez*, and L. Whittaker-Brooks*. Multi-Dimensional designer catalysts for negative emissions science (NES). *iScience*, 2022, **25**, 103700.

52. K. R. Hansen, C. E. McClure,# J. S. Colton, L. Whittaker-Brooks*. Franz-Keldysh and Stark effects in two-dimensional metal halide perovskites. *PRX Energy*, 2022, 1, 013001. [#]**Undergraduate student.**

51. E. Lafalce, E. Amerling, Y. Zhi-Gang, P. Sercel, L. Whittaker-Brooks, and V. Vardeny. Broken inversion symmetry and Rashba splitting in organic-inorganic lead-halide perovskites revealed through two-photon absorption spectroscopy. *Nat. Commun.*, 2022, **13**, 1-9.

50. D. Powell, K. Hansen, L. Flannery, and L. Whittaker-Brooks*. Traversing charge dynamic landscapes: Reduced dimensionality-inspired design of organic-metal halide semiconductors for energy applications. *Acc. Chem. Res.*, 2021, **54**, 4371-4382.

49. J. Ogle, D. Powell, L. Flannery, and L. Whittaker-Brooks*. Interplay between morphology and electronic structure in emergent organic and π-d conjugated organometal thin film materials. *Ind. Eng. Chem. Res.*, 2021, **60**, 15365- 15379. *2021 Class of Influential Researchers.*

48. E. Amerling, K. Hansen, and L. Whittaker-Brooks*. Resolving buried optoelectronic features in metal halide perovskites via modulation spectroscopy studies. *J. Mater. Chem A.*, 2021, **9**, 23746-23764.

47. M. Pham, E. Amerling, H. M. Luong, A. T. Ngo, K. Hansen, H. T. Pham, T. N. Vu, H. D. Tran, L. Whittaker-Brooks, T. D. Nguyen. Strong Rashba-Dresselhaus effect in nonchiral 2D Ruddlesden-Popper perovskites. *Adv. Opt. Mater.*, 2021, 2101232.

46. E. Amerling, Y. Zhai, B. W. Larson, Y. Yao, B. Fluegel, Z. Owczarczyk, H. Lu, L. Whittaker-Brooks, V. Blum, and J. L. Blackburn. Charge transfer states and carrier generation in 1D organolead iodide semiconductors. *J. Mater. Chem. A.*, 2021, **9**, 14977-14990.

45. J. Ogle, D. Powell, D. Norlund, D.–M. Smilgies, and L. Whittaker-Brooks*. Promoting band-like transport in well-defined and highly conducting polymer thin films via counter-ion dopant and polymerization effects. *ACS Appl. Polym. Mater.*, 2021, **3**, 2938-2949.

44. P. Ranga, A. Bhattacharyya, J. Ogle, L. Whittaker-Brooks, M. A. Scarpulla, and S. Krishnamoorthy. N-type doping of LPCVD-grown β-Ga_2O_3 thin films using solid-source germanium. *JVST A*, 2021, **39**, 030404.

43. E. Amerling, H. Lu, B. W. Larson, A. E. Maughan, A. Phillips, E. Lafalce, L. Whittaker-Brooks, J. Berry, M. C. Beard, Z. V. Vardeny, and J. L. Blackburn. A multidimensional perspective on electronic doping in metal halide perovskites. *ACS Energy Lett.*, 2021, **6**, 1104-1123.

42. D. Powell, E. Campbell, L. Flannery, J. Ogle, and L. Whittaker-Brooks*. Steric hindrance dependence on the spin and morphology properties of highly oriented self-doped organic small molecule thin films. *Mater. Adv.*, *2021*, **2**, 356-365.

41. L. Flannery, J. Ogle, D. Powell, C. J. Tassone, and L. Whittaker-Brooks*. Voltage bias stress effects in organic-inorganic halide perovskites are strongly dependent on morphology and ion migration pathways. *J. Mater. Chem. A.* 2020, **8**, 25109-25119.

40. E. Amerling, S. Baniya, E. Lafalce, S. Blair, V. Vardeny, and L. Whittaker-Brooks*. Quantifying exciton heterogeneities in mixed-phase organometal halide multiple quantum wells via Stark spectroscopy studies. *ACS Appl. Mater. Interfaces.*, 2020, **12**, 52538-52548.

39. J. Ogle, N. Lahiri, C. Jaye, C. J. Tassone, J. Louie, and L. Whittaker-Brooks*. Semiconducting to metallic electronic landscapes in defects controlled two-dimensional π-d conjugated coordination polymer thin films. *Adv. Funct. Mater.*, 2020, 2006920.

38. A. Bhattacharyya, P. Ranga, S. Roy, J. Ogle, L. Whittaker-Brooks, and S. Krishnamoorthy. Low temperature homoepitaxy of (010) β-Ga_2O_3 by metal-organic vapor phase deposition: Expanding the growth window. *Appl. Phys. Lett.*, 2020, **117**, 142102.

37. C. G. Hawkins, A. Verma, W. Horbinski, R. Weeks,[#] P. Mukherjee, and L. Whittaker-Brooks*. Decreasing the ion diffusion pathways for the intercalation of multivalent cations in defect-tolerant TiS_{2-x} nanobelt cathode insertion hosts. *ACS Appl. Mater. Interfaces*, 2020, **12**, 21788-21798. (featured as the front cover). [#]**Undergraduate student.**

36. M. T. Pham, E. Amerling, H. M. Luong, H. Dang, L. Whittaker-Brooks, and T. D. Nguyen. Origin of Rashba spin-orbit coupling in 2D and 3D lead iodide perovskites. *Sci. Rep.*, 2020, 10, 4964.

35. W. Nimens, S. Lefave, L. Flannery, M. Kieber-Emmons, and L. Whittaker-Brooks*. Understanding hydrogen bonding interactions in crosslinked methylammonium lead iodide crystals: towards moisture and light degradation pathways. *Angew. Chem. Int. Ed.*, 2019, **58**, 13912-13921.

34. J. Ogle, D.-M. Smilgies, and L. Whittaker Brooks*. Quantifying the degree of orientation and ordering in organic-inorganic interfaces via grazing incidence X-ray diffraction. *CrystEngComm*, 2019, **21**, 5707-5720. (featured as the back cover)

33. L. Flannery, H. Galvez,[#] W. Nimens, A. Rahman, and L. Whittaker-Brooks*. WWMOD? What would metal oxides do?: Redefining their applicability in today's energy technologies. *Polyhedron*, 2019, **170**, 334-358. [#]**Undergraduate student**

32. C. Fei, M. Zhou, J. Ogle, D.-M. Smilgies, L. Whittaker-Brooks, H. Wang. Self-assembled propylammonium cations at grain boundaries and film surface to improve efficiency and stability of perovskite solar cells. *J. Mater. Chem. A.*, 2019, **7**, 23739-23746.

31. M. Teferi, J. Ogle, D. L. Baird, S. Jamali, G. Joshi, H. Malissa, L. Whittaker Brooks, and C. Boehme. Tuning effective hyperfine fields in PEDOT:PSS thin films by doping. *Phys. Rev. B,* 2018, **98**, 241201(R).
30. C. Hawkins and L. Whittaker Brooks*. Vertically oriented TiS_{2-x} nanobelt arrays as binder- and carbon-free intercalation electrodes for Li- and Na-based energy storage devices. *J. Mater. Chem. A*, 2018, **6**, 21949-21960. (featured as the inside cover) ***Emerging Investigator Special Issue. Top 5% most-read paper in Q4 2018.***
29. W. Nimens, A. Caruso, M. Jonely, C. Simon, J. Ogle, D.-M. Smilgies, R. Noriega, M. Scarpulla, and L. Whittaker-Brooks*. Morphology and optoelectronic variations underlying the nature of the electron transport layer in perovskite solar cells. *ACS Appl. Energy Mater.*, 2018, **1**, 602-615.
28. C. Hawkins and L. Whittaker-Brooks*. Controlling sulfur vacancies in TiS_{2-x} cathode insertion hosts via the conversion of TiS_3 nanobelts for energy conversion storage. *ACS Appl. Nano Mater.*, 2018, **1**, 851-859.
27. C. Kilcoyne, A. Ali, A. AlSaqqa, A. A. Rahman, L. Whittaker-Brooks, and S. Ganapathy. Gate-tunable transport characteristics of Bi_2S_3 nanowire transistors. *Solid State Commun.*, 2018, **270**, 135-139.
26. A. Degrauw,[#] R. Armstrong,[#] A. A. Rahman, J. Ogle, and L. Whittaker-Brooks*. Catalytic growth of vertically-aligned SnS/SnS_2 p-n heterojunctions. *Mater. Res. Express*, 2017, **4**, 094002. [#]**Undergraduate students;** ***Emerging Investigator Special Issue***
25. E. Amerling, S. Baniya, E. Lafalce, C. Zhang, Z.-V. Vardeny, and L. Whittaker-Brooks*. Electroabsorption spectroscopy studies of $(C_4H_9NH_3)_2PbI_4$ organic-inorganic hybrid perovskite multiple quantum-wells. *J. Phys. Chem. Lett.*, 2017, **8**, 4557-4564.
24. A. A. Rahman, R. Huang, and L. Whittaker-Brooks*. Distinctive extrinsic atom effects on the structural, optical, and electronic properties of $Bi_2S_{3-x}Se_x$ solid solutions. *Chem. Mater.*, 2016, **28**, 6544-6552.
23. H. Wang, L. Valkunas, T. Cao, L. Whittaker-Brooks, and G. R. Fleming. Coulomb screening and coherent phonon in methylammonium lead iodide perovskites. *J. Phys. Chem. Lett.*, 2016, **7**, 3284-3289.
22. W. Nimens, L. Whittaker-Brooks, and M. H. Bartl. Enhanced sensing in mixed porous-solid photonic stacks. *J. Mater. Chem. C*, 2016, **4**, 668-672.
21. H. Wang, L. Whittaker-Brooks, and G. R. Fleming. Exciton and free charge dynamics in methylammonium lead iodide perovskites are different in the tetragonal and orthorhombic phases. *J. Phys. Chem. C*, 2015, **119**, 19590-19595.

Postdoctoral and graduate work

20. P. Schulz, L. Whittaker-Brooks, B. MacLeod, D. Olson, Y.-L. Loo, and Antoine Kahn. Electronic level alignment in inverted organometal perovskite solar cells. *Adv. Mater. Interfaces*, 2015, **2**, 1-6.
19. L. Whittaker-Brooks, J. Gao, A. K. Hailey, C. R. Thomas, N. Yao, and Y.-L. Loo. Bi_2S_3 nanowire networks as electron acceptor layers in solution-processed hybrid solar cells. *J. Mater. Chem. C*, 2015, **3**, 2686-2692.
18. A. A. Stabile, S. K. Singh, T.-L. Wu, L. Whittaker, S. Banerjee, and S. Ganapathy. Separating electric field and thermal effects across the metal-insulator transition in vanadium oxide nanobeams. *Appl. Phys. Lett.*, 2015, **107**, 013503.
17. Y. Ren, A. M. Hiszpanski, L. Whittaker-Brooks, and Y.-L. Loo. Structure-property relationship study of substitution effects on isoindigo derivatives as electron donors in organic solar cells. *ACS Appl. Mater. Interfaces*, 2014, **6**, 14533.
16. L. Whittaker-Brooks, W.E. McClain, J. Schwartz, and Y.-L. Loo. Donor-acceptor interfacial interactions dominate device performance in hybrid P3HT-ZnO nanowire-array solar cells. *Adv. Energy Mater.*, 2014, **4**, 1400585. (featured as the inside cover)
15. J. B. Hatch, L. Whittaker-Brooks, T.-L. Wu, G. Long, H. Zeng, S. Ganapathy, S. Banerjee and Hong Luo. Intermediate metallic phase in VO_2 observed with scanning tunneling spectroscopy. *Phys. Chem. Chem. Phys.*, 2014, **16**, 14183-14188.
14. J. M. Mativetsky, H. Wang, S. S. Lee, L. Whittaker-Brooks, and Y.-L. Loo. Face-on stacking and enhanced out-of-plane hole mobility in graphene-templated copper phthalocyanine. *Chem. Commun.*, 2014, **50**, 5319-5321.
13. L. Whittaker-Brooks, A. Woll, D.-M. Smilgies and Y.-L. Loo. Sputtered ZnO seed layer strongly enhances photovoltaic behavior in hybrid organic solar cells. *Org. Electron.*, 2013, **14**, 3477-3483.

12. C. Patridge, L. Whittaker**,** B. Ravel, and S. Banerjee, Elucidating the influence of local structure perturbations on the metal-insulator transitions of $V_xMo_{1-x}O_2$ nanowires: mechanistic insights from an X-ray absorption spectroscopy study. *J. Phys. Chem. C*, 2012, **116**, 3728–3736.
11. L. Whittaker, A. A. Stabile, T.-L. Wu, P. M Marley, S. Banerjee and S. Ganapathy, Synthesis, characterization, and finite size effects on electrical transport of nanoribbons of the charge density wave conductor $NbSe_3$. *Nanotechnol., 2011, **22**, 485201.*
10. L. Whittaker, T.-L. Wu, A. Stabile, S. Ganapathy, and S. Banerjee, Single-nanowire Raman microprobe studies of doping-, temperature-, and voltage induced metal–insulator transitions of $W_xV_{1-x}O_2$ nanowires. *ACS Nano*, 2011, **5**, 8861-8867.
9. L. Whittaker, C. Patridge, and S. Banerjee, A microscopic and nanoscale perspective of the metal-insulator phase transitions of VO_2: some new twists to an old tale. *J. Phys. Chem. Lett.*, 2011, **2**, 745-758. (featured as the front cover)
8. T.-L. Wu, L. Whittaker**,** S.Banerjee, and S. Ganapathy, Temperature and voltage driven tunable metal-insulator transition in individual $W_xV_{1-x}O_2$ nanowires. *Phys. Rev. B*, **83,** 073101.
7. L. Whittaker, C. Patridge, T.-L. Wu, S. Ganapathy, and S. Banerjee, Distinctive finite size effects on the phase diagram and metal – insulator transitions of tungsten-doped vanadium(IV) oxide. *J. Mater. Chem.*, 2011, **21**, 5580-5592. (featured as the front cover)
6. L. Whittaker, J. Velazquez, and S. Banerjee**,** A VO-seeded approach for the growth of star-shaped VO_2 and V_2O_5 nanocrystals: facile synthesis, structural characterization, and elucidation of electronic structure. *CrystEngComm*, 2011, **13,** 5328-5336. (featured as the front cover)
5. L. Whittaker, V. Lee, C. Jaye, K. M. Baroudi, D. A. Fischer, and S. Banerjee. Large-area chemically modified graphene films: electrophoretic deposition and characterization by soft X-ray absorption spectroscopy. *Chem. Mater.*, 2009, **21**, 3905-3916.
4. L. Whittaker, C. Jaye, Z. Fu, D. A. Fischer, and S. Banerjee, Depressed phase transition in solution-grown VO_2 nanostructures. *J. Am. Chem. Soc.*, 2009, **131**, 8884-8894.
3. L. Whittaker, H. Zhang, and S. Banerjee, VO_2 nanosheets exhibiting a well-defined metal—insulator phase transition. *J. Mater. Chem.*, 2009, ***19***, 2968-2974. (featured as the back cover)

PATENTS

2. US 20130101848 A1. Doped nanoparticles and methods of making and using same. 2012

1. US 20130156678 A1. Graphene films and methods of making thereof. 2011

SEMINARS AND PRESENTATIONS

Invited talks

64. Defects chemistry in energy related materials. UNC Chapel Hill, 2024.
63. Charge transport properties in 2D metal halide perovskites. SUNY Binghamton, MSE, 2023.
62. Insights into the electronic structure of doped π- and π-d conjugated organic systems via diffraction and soft X-ray spectroscopy. 15th International Symposium of Functional-pi Electron Systems (Raleigh, NC), 2023.
61. Chirality-induced charge transfer processes in metal halide perovskites. UPenn (Chemistry), 2023.
60. Chirality-induced charge transfer processes in metal halide perovskites. Ohio State University (Chemistry), 2023.
59. Self-doped organic semiconductors: concentration dependent radical and biradical formation. Northwestern (MSE), 2023.
58. Photoactivation properties of self-n-doped organic semiconductors. SUNY Binghamton, 2023.
57. Chirality-induced charge transfer processes in metal halide perovskites. Notre Dame (Chemistry), 2022.
56. Traversing charge transport landscapes: Reduced dimensionality-inspired design of organic-inorganic heterostructures for energy applications. Johns Hopkins University (Chemistry), 2022.
55. Self-doped organic semiconductors: concentration dependent radical and biradical formation. UC Berkeley (Chemistry), 2022.
54. Chirality-induced charge transfer processes in metal halide perovskites. Stanford (Chemistry), 2022.

53. Chirality-induced charge transfer processes in metal halide perovskites. Oklahoma State University (Chemistry), 2022.
52. Traversing charge transport landscapes: Reduced dimensionality-inspired design of organic-inorganic heterostructures for energy applications. Nature conference series. Hong Kong. May 19, 2022.
51. Photoactivation properties of self-n-doped organic semiconductors. MRS Spring 2022. In person meeting. May 9-12, 2022.
50. Excitons and ion dynamics in metal halide semiconductors. Conference on Atomic-level characterization of hybrid perovskites (HPATOM2). February 2, 2022.
49. Extrinsic and intrinsic doping in organic semiconductors. GATech. January 31, 2022.
48. The role of dimensionality on the spin and charge transport properties of metal halide semiconductors. MRS Fall Meeting, Invited speaker. Virtual meeting. December 7, 2021.
47. Designer organic-inorganic interfaces for coherent charge and spin transfer. Iowa State University, November 12, 2021. In-person meeting.
46. Designer organic-inorganic interfaces for coherent charge and spin transfer. University of Michigan, November 2, 2021. In-person meeting.
45. Addressing the disparity between being a non-traditional student and the guidelines imposed by contemporary research in STEM with a little bit of organic-inorganic interfaces. Rocky Mountain ACS Regional Meeting. October 22, 2021. In-person meeting.
44. Designer organic-inorganic interfaces for coherent charge and spin transfer. Wisconsin-Madison, September 16, 2021. In-person meeting.
43. Designer organic-inorganic interfaces for coherent charge and spin transfer. UIUC, April 8, 2021. Virtual meeting.
42. Addressing the disparity between being a non-traditional student and the guidelines imposed by contemporary research in STEM. Franklin and Marshall College (keynote speaker for the undergraduate STEM conference). April 2, 2022. In-person meeting.
41. Insights into the electronic structure of π- and π-d conjugated organic systems via diffraction and soft X-ray spectroscopy. UNC Chapel Hill, March 30, 2021. Virtual Meeting.
40. Designer organic-inorganic interfaces for coherent charge and spin transfer. NC State, March 29, 2021. Virtual meeting.
39. Insights into the electronic structure of π- and π-d conjugated organic systems via diffraction and soft X-ray spectroscopy. UNC Chapel Hill, March 30, 2021. Virtual Meeting.
38. Fundamental, state-of-the-art, and recent trends in nanostructured materials for energy and electronic applications. Creighton University, March 4, 2021. Virtual meeting.
37. Designer organic-inorganic interfaces for coherent charge and spin transfer. UMass Amherst, February 4, 2021. Virtual meeting.
36. Fundamental, state-of-the-art, and recent trends in nanostructured materials for energy and electronic applications. Metropolitan State University, Denver (recruiting seminar), January 29, 2021. Virtual meeting.
35. Designer organic-inorganic interfaces for coherent charge and spin transfer. University of Delaware, December 4, 2020. Virtual meeting.
34. Designer organic-inorganic interfaces for coherent charge and spin transfer. Harvard University, December 3, 2020. Virtual meeting.
33. Fundamental, state-of-the-art, and recent trends in nanostructured materials for energy and electronic applications. Tennessee State University, November 5, 2020. Virtual meeting.
32. Vapor-vapor and vapor-solid interactions in the formation of single-crystalline 2D coordination polymer thin films. Advanced Light Source, Stanford. August 25, 2020. Virtual meeting.
31. A non-traditional journey thru energy, electronics, and STEM. Spelman College. April 23, 2020 (virtually held due to COVID-19).
30. Investigating the optical and electrical properties of two-dimensional organic-inorganic hybrid perovskite multiple quantum wells via electroabsorption spectroscopy studies. Georgia Tech. April 24, 2020 (virtually held due to COVID-19).

29. Fundamental, state-of-the-art, and recent trends in nanostructured materials for energy and electronic applications. Franklin and Marshall College (keynote speaker for undergraduate STEM conference). April 4, 2020 (virtually held due to COVID-19).
28. The many facets of organic-inorganic halide perovskites: challenges and opportunities. Penn State University. April 2, 2020 (virtually held due to COVID-19).
27. Investigating the optical and electrical properties of two-dimensional organic-inorganic hybrid perovskite multiple quantum wells via electroabsorption spectroscopy studies. APS March Meeting 2020, Denver, CO, March 1 – March 5, 2020.
26. Extrinsic and intrinsic doping design principles in organic semiconductors. Texas A&M, November 12, 2019.
25. Fundamental, state-of-the-art, and recent trends in nanostructured materials for energy and electronic applications. St. Olaf College (recruiting seminar), November 8, 2019.
24. Fundamental, state-of-the-art, and recent trends in nanostructured materials for energy and electronic applications. Carleton College, November 7, 2019.
23. Addressing the disparity between being a non-traditional student and the guidelines imposed by contemporary research in STEM. Committee of Minority Affairs Luncheon Keynote Speaker. ACS Fall Meeting, San Diego, CA.
22. Investigating the optical and electrical properties of two-dimensional organic-inorganic hybrid perovskite multiple quantum wells via electroabsorption spectroscopy studies. Novel Optical Materials and Applications (NOMA) Conference, San Francisco, CA. July 29-August 1, 2019.
21. HOPE Workshop. In situ and in operando characterization of energy devices via synchrotron techniques. National Renewable Energy Laboratory, Denver, Colorado, July 18, 2019.
20. Fundamental, state-of-the-art, and recent trends in nanostructured materials for energy and electronic applications. Colorado College (recruiting seminar), May 3, 2019.
19. Extrinsic and intrinsic doping design principles in organic semiconductors. University of Buffalo, April 26, 2019.
18. Self-dopant design rules in n-type organic thermoelectrics. Yale University. February 6, 2019.
17. Morphology and optoelectronic variations underlying the nature of the electron transport layer in perovskite solar cells. Joint Undertaking for an African Materials Institute, NSF sponsored workshop, Uganda, December 9-22, 2018.
16. Toward establishing self-dopant design rules in n-type organic thermoelectrics. Material Research Society Fall Meeting 2018, Boston, MA, November 27 – December 2, 2018.
15. Fundamental, state-of-the-art, and recent trends in nanostructured materials for energy and electronic applications. Montana Tech, November 30, 2018.
14. In situ and in operando characterization of energy devices via synchrotron techniques. National Renewable Energy Laboratory, Denver, Colorado, July 9, 2018.
13. Nanostructured metal chalcogenide networks for multivalent ion batteries. Spring MRS. Phoenix, Arizona. April 2-6, 2018.
12. Nanostructured metal chalcogenide networks as carbon- and binder-free cathode materials for Li, Na, and Al-ion batteries. 233rd ECS Meeting. Seattle, Washington. May 13-17, 2018.
11. Tailoring defects and orientation in nanostructured metal chalcogenide cathode insertion hosts. Pacific Northwest Laboratory, Pasco, Washington, June 19-22, 2018.
10. Fundamental, state-of-the-art, and recent trends in nanostructured materials for energy and electronic applications. Wayne State University, Detroit, Michigan, April 5, 2018.
9. Morphology and optoelectronic variations underlying the nature of the electron transport layer in perovskite solar cells. 2018 Conference on excited state processes, Los Alamos National Laboratory, Santa Fe, New Mexico, June 4- June 7, 2018.
8. Manipulating the thermoelectric properties of polymer semiconductors. ACS March Meeting 2018, New Orleans, LA March 18 – March 22, 2018.
7. Materials for applications in solar energy conversion, thermoelectrics, batteries, and electronics. APS March Meeting 2018, Los Angeles, CA, March 5 – March 9, 2017.
6. Manipulating the thermoelectric and spin properties of polymeric systems. International Conference on Organic and Hybrid Thermoelectrics, Valencia, Spain January 29 – February 1, 2018.

5. Fundamental, state-of-the-art, and recent trends in nanostructured materials for energy and electronic applications. BYU Idaho, February 6, 2017.
4. Fundamental, state-of-the-art, and recent trends in nanostructured materials for energy and electronic applications. Idaho State University, February 7, 2017.
3. Counter ion and dopant effects on the thermoelectric properties of Poly(3,4-ethylenedioxythiophene) thin films. Material Research Society Fall Meeting 2016, Boston, MA, November 27 – December 2, 2016.
2. Bi_2S_3 nanowire networks as electron transport layers in solution-processed hybrid solar cells. 45^{th} IUPAC Congress, Busan South Korea, August 6-14, 2015.
1. Synthesis, characterization, and device fabrication of metal chalcogenides nanostructures for solar and waste-heat energy conversions. Pacifichem, Honolulu, Hawaii, December 15-20, 2015.