

Steven R. Spurgeon, Ph.D.

Energy and Environment Directorate
Pacific Northwest National Laboratory
902 Battelle Boulevard, Richland, WA 99352

Phone: +1 (509) 371-7709
Email: steven.spurgeon@pnnl.gov
Web: www.stevenspurgeon.com

Professional Summary

Internationally-recognized materials scientist with 13 years of experience in the data-driven discovery and design of nanomaterials, with a history of transformative research resulting in dozens of publications and invited talks. Expert in multimodal quantification of atomic-scale defects, scanning transmission electron microscopy, and electron energy loss spectroscopy. Recipient of awards from the Department of Energy, Department of Defense, National Science Foundation, Materials Research Society, and Microscopy Society of America. Broad experience leading multidisciplinary teams to deliver unique science and solutions to government, academia, and industry.

Research Experience

Research Scientist III

Jan 2020 – Present

Pacific Northwest National Laboratory, Richland, WA

- Leading efforts data-driven materials design and analytics using advanced scanning transmission electron microscopy, image analytics, and simulations.
- Leading interdisciplinary teams to examine evolution of functional oxides in extreme environments and developing automated data collection platform with commercial partners.
- Thrust lead for “Functional Materials” Use Case of PNNL Chemical Dynamics Initiative (CDi) and co-lead for PNNL Materials Characterization Processing and Control Initiative (MCPC).
- PI for CDi and Electrochemical Storage Materials Initiative (ESMI) projects in quantification of oxide defects and AI-driven microscopy.
- Co-PI for DOE-BES core program in oxide synthesis, leading efforts in data-driven quantification of nanoscale defects and development of advanced microscopies.
- Co-PI for FUTURE DOE Energy Frontier Research Center (EFRC), examining mass transport in reactor materials under extreme environments using high-resolution STEM imaging and simulations.

Affiliate Associate Professor of Physics

Dec 2021 – Present

University of Washington, Seattle, WA

- Leading development of artificial intelligence-driven materials discovery and design for quantum information science and condensed matter physics.
- Supporting NSF program development and facilitating Northwest partnerships in electron microscopy.
- Mentoring students through UW-DIRECT and Industry Capstone Programs in applied data science.

Research Scientist II

Oct 2017 – Dec 2019

Pacific Northwest National Laboratory, Richland, WA

- Developed correlative atomic-scale imaging and simulation workflow to examine structure-property relationships in oxide- and semiconductor-based thin film materials systems.
- Led \$650k LDRD project to examine structure-property relationships in irradiated functional oxides and submitted proposal for new core research program in DOE Basic Energy Sciences office.
- Installed and commissioned flagship aberration-corrected JEOL GrandARM-300F STEM to examine nuclear, electronic, and functional materials.
- Organized new workshop series on Next-Generation Transmission Electron Microscopy (NexTEM), leading to partnership with Microscopy Society of America and National Science Foundation.
- Contributed to the renewal of multi-million dollar DOE-BES research programs through 17 high-impact publications and received outstanding PNNL staff performance award for NexTEM workshop.
- Research featured by DOE Office of Science, Office of Nuclear Energy, and Materials Research Society.

Postdoctoral Research Associate Jan 2015 – Sep 2017
Pacific Northwest National Laboratory, Richland, WA

- Pioneered a novel multi-dimensional analysis approach for structure-property relationships in complex oxides, combining analytical STEM with APT and theory calculations.
- Explored the fundamental limitations of atomic-scale chemical mapping using an extensively optimized aberration-corrected JEOL ARM-200CF STEM in combination with multislice theory calculations.
- Contributed to the renewal of multi-million dollar DOE-BES research programs through 11 high-impact publications.
- Awarded postdoctoral research award from the Microscopy Society of America and performance award from PNNL.

Visiting Researcher Jun 2010 – Sep 2014
National Institute of Standards and Technology, Gaithersburg, MD

- Designed a functional *in situ* electric field biasing setup for neutron reflectometry, leading to direct measurements of electric field switching of magnetization in an oxide thin film.
- Awarded a half dozen successful beamtime proposals and invited to give talks at several national laboratories.

Visiting Researcher Apr 2011 – Jun 2012
Oak Ridge National Laboratory, Oak Ridge, TN

- Conducted the first reported substrate-controlled poling studies of magnetoelectric heterostructures using PNR, resulting in several peer-reviewed journal articles and conference presentations.

High Temperature Alloys Research Intern Jun 2008 – Aug 2008
Carpenter Specialty Alloys, Reading, PA

- Coordinated review and testing of magnetic alloy product lines leading to a widely-disseminated internal white paper.

Undergraduate Research Assistant Aug 2007 – Aug 2008
Carnegie Mellon University, Pittsburgh, PA

- Stabilized layered perovskites using pulsed laser deposition, resulting in a peer-reviewed journal article and research grant.

National Science Foundation Research Experiences for Undergraduates (REU) Intern May 2007 – Aug 2007
University of Colorado, Boulder, CO

- Identified promising candidates for Li-ion polymer batteries, which were presented at a user workshop.

Education

Ph.D. in Materials Science and Engineering 2009 – 2014
Drexel University, Philadelphia, PA

- Thesis title: “Correlating interfacial structure and magnetism in thin-film oxide heterostructures using transmission electron microscopy and polarized neutron reflectometry.”
- Advisor: Mitra Taheri (Presently Johns Hopkins University)

B.S. in Materials Science and Engineering 2005 – 2009
Carnegie Mellon University, Pittsburgh, PA

Honors and Awards

Innovation in Research Award , Pacific Northwest National Laboratory	2021
Directorate Core Values Award , Pacific Northwest National Laboratory	2020
Outstanding Performance Award for Electron Microscope Management , Pacific Northwest National Laboratory	2020
Outstanding Performance Award for NexTEM Workshop 2018 , Pacific Northwest National Laboratory	2018
Pathway to Excellence Award , Pacific Northwest National Laboratory	2017
Outstanding Poster Award , Advances in Structural and Chemical Imaging Workshop	2017
Outstanding Poster Award , Advances in Structural and Chemical Imaging Workshop	2016

Postdoctoral Research Award , Microscopy Society of America	2016
National Defense Science & Engineering Graduate (NDSEG) Fellowship , Department of Defense	2011 – 2014
Presidential Student Award , Microscopy Society of America	2013
Gold Graduate Student Research Award , Materials Research Society	2013
GMAG Travel Award , American Physical Society	2013
Conference Travel Award , Neutron Scattering Society of America	2012
FGSA Travel Award , American Physical Society	2012
Integrative Graduate Education and Research Traineeship (IGERT) Fellowship , National Science Foundation	2009 – 2011
Provost's Fellowship , Drexel University	2009 – 2011
X-ray and Neutron Scattering Scholarship , Argonne / Oak Ridge National Laboratories	2010
Axel-Madsen Conference Grant , Center for Powder Metallurgy Technology	2010
SMART Fellowship Semi-Finalist , Department of Defense	2010
Steel Engineering Education Link Scholarship , Association of Iron and Steel Technology	2007 – 2009
Chairperson's Educational Assistance Scholarship , ASM International	2007

Research Grants

- Pope, J., Akers, S., Spurgeon, S.R., and G. Chin. (2021). **"Few-Shot Machine Learning."** RDI Program. \$750k total FY 22–23.
- Matthews, B.E., Spurgeon, S.R., Albrecht, A., Pope, T., and C.A. Barrett. (2021). **"Multi-scale Analysis for Bulk Pore Volume and Microstructure Characterization."** Tritium Science Program. \$96k total FY 22.
- Spurgeon, S.R., Olszta, M., Hopkins, D., M. Oostrom, and S. Reehl. (2021). **"Development of an Artificial Intelligence-Driven Electron Microscope to Accelerate Energy Storage Material Discovery and Design."** Pacific Northwest National Laboratory LDRD Program. \$125k total FY 22.
- Chambers, S., Du, Y., Wang, L., Sushko, P. and S.R. Spurgeon. (2020). **"Electronic, Magnetic and Optical Properties of Doped Metal Oxides Epitaxial Films and Interfaces."** Department of Energy Office of Science. \$4.7M total FY 21–23.
- Spurgeon, S.R., Taylor, S.D., Sassi, M., and B. Matthews. (2020). **"Multimodal Quantification of Nanoscale Defect Evolution in Heterostructured Interfaces."** Pacific Northwest National Laboratory LDRD Program. \$500k total FY 21–22.
- Spurgeon, S.R., Olszta, M., Hopkins, D., and S. Reehl. (2020). **"Automated Electron Microscope Data Collection, Triaging, and Classification Platform."** Pacific Northwest National Laboratory LDRD Program. \$209k total FY 20–21.
- Spurgeon, S.R., Sassi, M., and K. Rosso. (2017). **"Damage Mechanisms and Defect Formation in Irradiated Model Systems."** Pacific Northwest National Laboratory LDRD Program. \$650k total FY 18–20.
- Chambers, S., Sushko, P., Kaspar, T., Du, Y., Droubay, T., Bowden, M., and S.R. Spurgeon. (2017). **"Electronic, Magnetic and Optical Properties of Doped Metal Oxides Epitaxial Films and Interfaces."** Department of Energy Office of Science. \$3.871M total FY 18–20.
- Edwards, D.J., Spurgeon, S.R., Zhu, Y., and B.D. Hanson. (2017). **"Statistical Microscopy Conjoined with Deep Learning - Revolutionary Insights Across Length Scales."** Pacific Northwest National Laboratory LDRD Program. \$175k total FY 18.
- Spurgeon, S.R. and B.R. Johnson. (2017). **"International Workshop on Next-Generation Transmission Electron Microscopy."** Pacific Northwest National Laboratory Quickstarter Program. \$6k total FY 18.
- Spurgeon, S.R. and M. Olszta. (2017). **"DRIFTER: Automatic Image Distortion Correction for Transmission Electron Microscopy."** Pacific Northwest National Laboratory Quickstarter Program. \$5k total FY 18.
- Spurgeon, S.R. and P.A. Salvador. (2007). **"Synthesis of oxynitride ABO_2N thin films using a two-step processing approach."** Carnegie Mellon University Undergraduate Research Grants Program. \$2k total 2007.

Synergistic Activities

Conference and Workshop Organization

Organizer, Microscopy Infrastructures Symposium, Microscopy and Microanalysis 2022	Aug 2022
Panelist, Microscopy Careers Miniseries, Microscopy Society of America	Jun 2021
Roundtable Participant, Decadal Plan for Semiconductors, Semiconductor Research Corporation	Jun 2021
Organizer, Electron Energy Loss Spectroscopy Symposium A03, Microscopy and Microanalysis 2020	Aug 2020
Organizer, Government Lab and Industry Career Workshop, Materials Research Society Spring Meeting	Apr 2020
Organizer, NexTEM Pre-Meeting Congress, Microscopy and Microanalysis 2019	Aug 2019
Session Chair, Science Communication Workshop, Materials Research Society Spring Meeting	Apr 2019
Organizer, Complex Oxide and Chalcogenide Semiconductors Symposium, EMA Meeting 2019	Jan 2019
Organizer, Next-Generation Transmission Electron Microscopy (NexTEM) Workshop, PNNL	Oct 2018
Session Chair, Science Communication Workshop, Materials Research Society Spring Meeting	Apr 2018
Co-Organizer, IAEA Nuclear Forensics Methodologies Workshop, PNNL	Apr 2018
Session Chair, Science Communication Workshop, Materials Research Society Spring Meeting	Apr 2017
Session Chair, Thin Film Imaging Symposium, Microscopy and Microanalysis 2016	Aug 2016
Session Chair, Magnetic Oxide Thin Films and Heterostructures, American Physical Society March Meeting	Mar 2014

Professional Service

Editor, Microscopy and Microanalysis Journal	2022 – Present
Advisor, User Executive Committee, Molecular Foundry	2021 – Present
Chair, Aberration-Corrected Electron Microscopy Committee, Microscopy Society of America	2021 – Present
Member, Molecular Foundry Proposal Review Board, Lawrence Berkeley National Laboratory	2020 – Present
Science Communication Consultant, Materials Research Society	2011 – Present
Member, Early Career Professionals Subcommittee, Materials Research Society	2018 – 2020
Regular reviewer for proposals from Department of Energy–Office of Science and National Science Foundation.	
Regular reviewer for <i>Nature Communications</i> , <i>Science Advances</i> , <i>npj Computational Materials</i> , <i>Acta Materialia</i> , <i>Physical Review Materials</i> , <i>Applied Physics Letters</i> , <i>Applied Physics Reviews</i> , <i>Journal of Applied Physics</i> , <i>Journal of Magnetism and Magnetic Materials</i> , <i>APL Materials</i> , <i>Microscopy and Microanalysis</i> , <i>Micron</i> , <i>IEEE Transactions on Magnetism</i> , APS and MRS Conference Proceedings	

Department Service

Advisor, Energy and Machine Learning (eML) Interest Group, Pacific Northwest National Laboratory	2022 – Present
Lead, Artificial Intelligence for Materials Science COIN, Pacific Northwest National Laboratory	2021 – Present
Staff Advisor, Postdoctoral Council, Pacific Northwest National Laboratory	2017 – 2020
Officer, Postdoctoral Council, Pacific Northwest National Laboratory	2015 – 2017
Officer, Graduate Student Council, Drexel University	2010 – 2013

Mentorship

Christina Doty, Post-Masters Researcher, Pacific Northwest National Laboratory	2021 – Present
Bethany Matthews, Scientist II, Pacific Northwest National Laboratory	2018 – Present
Alexander Bard, DOE SCGSR Fellow, University of Washington	2018 – Present
UW DIRECT Capstone Program Team, University of Washington	2022

Pedro Rodriguez, DOE SULI Intern, University of Puerto Rico	2021
Sydney Neuman, DOE SULI Intern, Rensselaer Polytechnic Institute	2021
Nina Hooper, NSIP Intern, University of Colorado – Boulder	2021
UW DIRECT Capstone Program Team, University of Washington	2021
Minfei Fei, Graduate Student, Nanjing University	2016
James Hart, Graduate Student, Drexel University	2012–2014
Ian McDonald, Masters Student, Drexel University	2011–2012

Teaching

Microscopy Working Group Seminar Series, Pacific Northwest National Laboratory	2016 – 2018
Metals Processing Laboratory Class (MATE 366), Drexel University	2009 – 2013

Community Outreach

Invited Speaker, PNNL Community Science and Technology Seminar Series	2019
Microscopy Lecturer, Mid-Columbia STEM Collaboratory	2015 – 2017
Microscopy Lecturer, Philly Materials Science and Engineering Day	2011 – 2014
Demonstration Volunteer, Philadelphia Science Festival	2013 – 2014
High School and Freshman Visit Lecturer, Drexel University	2010 – 2013

Professional Society Memberships

Materials Research Society (MRS), American Physical Society (APS), Microscopy Society of America (MSA), and Microanalysis Society (MAS)

Patents

Reehl, S. and S.R. Spurgeon (2021). “**Artificial intelligence (AI) assisted analysis of electron microscope data.**” Provisional Patent Application.

Taheri, M., Sunday, K.J., Spurgeon, S.R., and S.J. May (2015). “**Soft magnetic composites for electric motors.**” International Patent Application #WO2015100244A1

Software

Oostrom, M. and Spurgeon, S.R. (2022). “**TEMWizard.**” TEMWizard is used to visualize intermediate and final results from Atomap, an open-source software tool for determining the position and other features of atomic columns in transmission electron microscopy (TEM) images. Available on GitHub at <https://github.com/pnnl/temwizard>.

Doty, C., Gallagher, S., Cui, W., Chen, W., Bhushan, S., Oostrom, M., Akers, S., and Spurgeon, S.R. (2021). “**pyCHIP.**” Graphical user interface for image segmentation and feature classification in transmission electron microscopy (TEM) images based on a small support set of user-provided examples. Available on GitHub at https://github.com/pnnl/pychip_gui.

Akers, S.M. and Spurgeon, S.R. (2021). “**WizEM.**” Few-shot machine learning microscope analysis software.

Hopkins, D., Spurgeon, S.R., Akers, S.M., and Olszta, M.J. (2021). “**AutoEM.**” Autonomous microscope control software.

S.R. Spurgeon (2015). “**XTL-Converter.**” Conversion script for the μ STEM software package for STEM multislice and ionization map simulations. Available on GitHub at DOI:10.5281/zenodo.33072.

Peer-Reviewed Publications

58 publications and over 962 citations with an *h*-index of 18.

Journal Articles

- 2022 Bredar, A.R.C., Blanchet, M.D., Burton, A.R., Matthews, B.E., Spurgeon, S.R., Comes, R.B., and B.H. Farnum. **“Oxygen reduction electrocatalysis with epitaxially grown spinel MnFe_2O_4 and Fe_3O_4 .”** *ACS Catalysis*. (2022). In press.
- Chambers, S.A., Chrysler, M., Ngai, J., Lee, T.-L., Gabel, J., Matthews, B.E., Spurgeon, S.R., Bowden, M.E., Zhu, Z., and P.V. Sushko. **“Mapping hidden space-charge distributions across crystalline metal oxide/group IV semiconductor interfaces.”** *Physical Review Materials*. 6 (2022): 015002. DOI:10.1103/PhysRevMaterials.6.015002
- Doty, C., Gallagher, S., Cui, W., Chen, W., Bhushan, S., Oostrom, M., Akers, S., and S.R. Spurgeon. **“Design of a graphical user interface for few-shot machine learning-based classification of electron microscopy data.”** *Computational Materials Science*. 203.15 (2022): 111121. DOI:10.1016/j.commatsci.2021.111121
- 2021 Burton, A., Paudel, R., Matthews, B.E., Sassi, M., Spurgeon, S.R., Farnum, B.H., and R.B. Comes. **“Thickness dependent OER electrocatalysis of epitaxial LaFeO_3 thin films.”** *Journal of Materials Chemistry A*. (2021). In press. DOI:10.1039/D1TA07142D
- Yano, K., Kohnert, A., Kaspar, T.C., Taylor, S.D., Spurgeon, S.R., Kim, H., Wang, Y., Uberuaga, B.P., and D.K. Schreiber. **“Radiation enhanced anion diffusion in chromia.”** *Journal of Physical Chemistry C*. 125.50 (2021): 27820–27827. DOI:10.1021/acs.jpcc.1c08705
- Akers, S., Kautz, E., Trevino-Gavito, A., Olszta, M., Matthews, B., Wang, L., Du, Y., and S.R. Spurgeon. **“Rapid and flexible segmentation of electron microscopy data using few-shot machine learning.”** *npj Computational Materials*. 7 (2021): 187. DOI:10.1038/s41524-021-00652-z
- Chrysler, M., Gabel, J., Lee, T.-L., Penn, A., Matthews, B.E., Kepaptsoglou, D., Ramasse, Q., Paudel, J.R., Sah, R.K., Grassi, J.D., Zhu, Z., Gray, A.X., LeBeau, J.M., Spurgeon, S.R., Chambers, S.A., Sushko, P.V., and J.H. Ngai. **“Tuning band alignment at a semiconductor-crystalline oxide heterojunction via electrostatic modulation of the interfacial dipole.”** *Physical Review Materials*. 5 (2021): 104603. DOI:10.1103/PhysRevMaterials.5.104603
- Wang, L., Adiga, P., Zhao, J., Samarakoon, W.S., Stoerzinger, K., Matthews, B.E., Spurgeon, S.R., Bowden, M.E., Sushko, P.V., Wang, H., Wangoh, L., Wu, J., Guo, E., Qian, H., Wang, J., Vargas, T., Thevuthasan, S., Feng, Z., Yang, W., Du, Y., and S.A. Chambers. **“Understanding the electronic structure evolution of epitaxial $\text{LaNi}_{1-x}\text{Fe}_x\text{O}_3$ thin films for water oxidation.”** *Nano Letters*. 21.19 (2021): 8324–8331. DOI:10.1021/acs.nanolett.1c02901
- Yu, X.-Y., Yao, J., Matthews, B.E., Spurgeon, S.R., Riechers, S.L., Sevigny, G.J., Zhu, Z., Jiang, W., and W.G. Luscher. **“Evidence of lithium mobility under neutron irradiation.”** *Journal of Materials Research and Technology*. 14 (2021): 475–483 (2021). DOI:10.1016/j.jmrt.2021.06.066
- Matthews, B., Sassi, M., Barr, C., Ophus, C., Kaspar, T., Jiang, W., Hattar, K., and S.R. Spurgeon. **“Percolation of ion-irradiation-induced disorder in complex oxide interfaces.”** *Nano Letters*. 21.12 (2021): 5353–5359. DOI:10.1021/acs.nanolett.1c01651
- Kaspar, T.C., Spurgeon, S.R., Matthews, B.E., Bowden, M.E., Heald, S.M., Wang, L., Kelley, R., Paudel, R., Isaacs-Smith, T., Comes, R.B., Yin, X., Tang, C.-S., Wee, A.T.S., and S.A. Chambers. **“Incorporation of Ti in epitaxial Fe_2TiO_4 thin films.”** *Journal of Physics: Condensed Matter*. 33 (2021): 314004. DOI:10.1088/1361-648X/ac0571
- Spurgeon, S.R., Ophus, C., Jones, L., Petford-Long, A., Kalinin, S.V., Olszta, M.J., Dunin-Borkowski, R., Salmon, N., Hattar, K., Yang, W.-C.D., Sharma, R., Du, Y., Chiaramonti, A., Zheng, H., Buck, E.C., Kovarik, L., Penn, R.L., Li, D., Zhang, X., Murayama, M., and M.L. Taheri. **“Towards data-driven next-generation transmission electron microscopy.”** *Nature Materials*. 20.3 (2021): 274–279. DOI:10.1038/s41563-020-00833-z
- Kaspar, T.C., Taylor, S.D., Yano, K.H., Lach, T.G., Zhou, Y., Zhu, Z., Kohnert, A.A., Still, E.K., Hosemann, P., Spurgeon, S.R., and D.K. Schreiber. **“Bulk and short-circuit anion diffusion in epitaxial Fe_2O_3 films quantified using buried isotopic tracer layers.”** *Advanced Materials Interfaces*. 8.9 (2021): 2001768. DOI:10.1002/admi.202001768

- 2020 Blanchet, M.D., Heath, J.J., Kaspar, T.C., Matthews, B.E., Spurgeon, S.R., Bowden, M.E., Heald, S.M., Issacs-Smith, T., Kuroda, M.A., and R.B. Comes. **“Electronic and structural properties of single-crystal Jahn-Teller active $\text{Co}_{1+x}\text{Mn}_{2-x}\text{O}_4$ thin films.”** *Journal of Physics: Condensed Matter*. 33 (2020): 124002. DOI:10.1088/1361-648X/abd573
- S.R. Spurgeon. **“Order-disorder behavior in oxide thin film interfaces.”** *Current Opinion in Solid State and Materials Science*. 24.6 (2020): 100870. DOI:10.1016/j.cossms.2020.100870
- Wang, L., Yang, Z., Bowden, M.E., Freeland, J.W., Sushko, P.V., Spurgeon, S.R., Matthews, B., Samarakoon, W.S., Zhou, H., Feng, Z., Engelhard, M.H., Du, Y., and S.A. Chambers. **“Hole-trapping-induced stabilization of Ni^{4+} in SrNiO_3 / LaFeO_3 superlattices.”** *Advanced Materials*. 32.45 (2020): 2005003. DOI:10.1002/adma.202005003
- Jiang, W., Spurgeon, S.R., Matthews, B., Battu, A.K., China, S., Varga, T., Marcus, M.A., and W.G. Luscher. **“Carbonaceous deposits on aluminide coatings in tritium-producing assemblies.”** *Nuclear Materials and Energy*. 25 (2020): 100797. DOI:10.1016/j.nme.2020.100797
- Popel, A.J., Spurgeon, S.R., Matthews, B., Olszta, M.J., Tan, B.T., Gouder, T., Eloirdi, R., Buck, E.C., and I. Farnan. **“An atomic-scale understanding of UO_2 surface evolution during anoxic dissolution.”** *ACS Applied Materials & Interfaces*. 12.35 (2020): 39781–39786. DOI:10.1021/acsami.0c09611
- Durnev, M.V., Glazov, M.M., Linpeng, X., Viitaniemi, M., Matthews, B., Spurgeon, S.R., Sushko, P.V., and K.M. Fu. **“Microscopic model of stacking fault potential and exciton wave function in GaAs.”** *Physical Review B*. 101 (2020):125420 DOI:10.1103/PhysRevB.101.125420
- Bard, A., Zhou, X., Xia, X., Zhu, G., Lim, M., Kim, S., Johnson, M., Kollman, J., Marcus, M., Spurgeon, S.R., Perea, D., Devaraj, A., Chun, J., DeYoreo, J., and P.J. Pauzauskie. **“Non-classical hydrothermal synthesis of hexagonal sodium yttrium fluoride nanowires.”** *Chemistry of Materials*. 32.7 (2020): 2753–2763. DOI:10.1021/acs.chemmater.9b04076
- Spurgeon, S.R., Kaspar, T.C., Shutthanandan, V., Gigax, J., Shao, L., and M. Sassi. **“Asymmetric lattice disorder induced at oxide interfaces.”** *Advanced Materials Interfaces*. 7.8 (2020): 1901944. DOI:10.1002/admi.201901944
- Scafetta, M.D., Bowden, M.E., Spurgeon, S.R., Kaspar, T.C., and S.A. Chambers. **“Reversible oxidation quantified by optical properties in epitaxial $\text{Fe}_2\text{CrO}_{4+\delta}$ films on (001) MgAl_2O_4 .”** *ACS Omega*. 5.7 (2020): 3240–3249. DOI:10.1021/acsomega.9b03299
- 2019 Spurgeon, S.R., Sassi, M., Ophus, C., Stubbs, J.E., Ilton, E.S., and E.C. Buck. **“Nanoscale oxygen defect gradients in UO_{2+x} surfaces.”** *Proceedings of the National Academy of Sciences*. 116.35 (2019): 17181–17186. DOI:10.1073/pnas.1905056116
- Sassi, M., Kaspar, T.C., Rosso, K.M., and S.R. Spurgeon. **“Effect of structure and composition on the electronic excitation induced amorphization of $\text{La}_2\text{Ti}_{2-x}\text{Zr}_x\text{O}_7$ ceramics.”** *Scientific Reports*. 9 (2019): 8190. DOI:10.1038/s41598-019-44621-5
- Scafetta, M.D., Yang, Z., Spurgeon, S.R., Bowden, M.E., Kaspar, T.C., Heald, S.M., and S.A. Chambers. **“Epitaxial growth and atomic arrangement in Fe_2CrO_4 on crystal symmetry matched (001) MgAl_2O_4 .”** *Journal of Vacuum Science and Technology A*. 37 (2019): 031511. DOI:10.1116/1.5093537
- Kaspar, T.C., Sushko, P.V., Spurgeon, S.R., Bowden, M.E., Keavney, D.J., Comes, R.B., Saremi, S., Martin, L.W., and S.A. Chambers. **“Electronic structure and band alignment of LaMnO_3 / SrTiO_3 polar / nonpolar heterojunctions.”** *Advanced Materials Interfaces*. 6(1) (2019): 1801428. DOI:10.1002/admi.201801428
- Kaspar, T.C., Schemer-Kohrn, A., Arendt, C., Rutherford, C., Lavender, C., Neal, D., Sweet, L., Shimskey, R., Riechers, S., Spurgeon, S.R., and V. Joshi. **“Characterization of surface layers formed on DU10Mo ingots after processing steps and high humidity exposure.”** *Journal of Nuclear Materials*. 514 (2019): 28–39. DOI:10.1016/j.jnucmat.2018.11.022
- 2018 Lin, S-C., Kuo, C-T., Comes, R.B., Rault, J.E., Rueff, J-P., Nemsak, S., Taleb, A., Kortright, J.B., Meyer-Ilse, J., Gulikson, E., Sushko, P.V., Spurgeon, S.R., Gehlman, M., Plucinski, L., Chambers, S.A., and C.S. Fadley. **“Interface properties and built-in potential profile of a LaCrO_3 / SrTiO_3 superlattice determined by standing-wave excited photoemission spectroscopy.”** *Physical Review B*. 98 (2018): 165124. DOI:10.1103/PhysRevB.98.165124

- Gilbert, D.A., Murray, P., Lonin, A., Spurgeon, S.R., Chopdekar, R., Kirby, B.J., Maranville, B.B., Borchers, J.A., N'Diaye, A.T., Liu, K., Arenholz, E., Takamura, Y., and A.J. Grutter. **“Ionic tuning of cobaltites at the nanoscale.”** *Physical Review Materials*. 2 (2018): 104402. DOI:10.1103/PhysRevMaterials.2.104402
- Du, Y., Sushko, P.V., Spurgeon, S.R., Bowden, M.E., Ablett, J.M., Lee, T.-L., Quackenbush, N.F., Woicik, J.C., and S.A. Chambers. **“Layer resolved band bending at the n -SrTiO₃ / p -Ge (001) interface.”** *Physical Review Materials*. 2 (2018): 094602. DOI:10.1103/PhysRevMaterials.2.094602
- Jiang, W., Spurgeon, S.R., Zhu, Z., Yu, X., Kruska, K., Wang, T., Gigax, J., Shao, L., and D.J. Senor. **“Chemical imaging and diffusion of hydrogen and lithium in lithium aluminate.”** *Journal of Nuclear Materials*. 511 (2018): 1–10. DOI:10.1016/j.jnucmat.2018.08.057
- Chambers, S.A., Du, Y., Zhu, Z., Wang, J., Wahila, M.J., Piper, L.F.J., Prakash, A., Yue, J., Jalan, B., Spurgeon, S.R., Kepaptsoglou, D., Ramasse, Q.M., and P.V. Sushko. **“Interconversion of intrinsic defects in SrTiO₃ (001) monitored using deep in-gap photoemission.”** *Physical Review B*. 97 (2018): 245204. DOI:10.1103/PhysRevB.97.245204
- Zhang, K.H., Li, G., Spurgeon, S.R., Wang, L., Yan, P., Wang, Z., Gu, M., Varga, T., Bowden, M.E., Zhu, Z., Wang, C.-M., and Y. Du. **“Creation and ordering of oxygen vacancies at WO_{3- δ} and perovskite interfaces.”** *ACS Applied Materials & Interfaces*. 10.20 (2018): 17480–17486. DOI:10.1021/acsami.8b03278
- Spurgeon, S.R., Sushko, P.V., Devaraj, A., Du, Y., Droubay, T., and S.A. Chambers. **“Onset of phase separation in the double perovskite oxide La₂MnNiO₆.”** *Physical Review B*. 97 (2018): 134110. DOI:10.1103/PhysRevB.97.134110
- Stoerzinger, K.A., Du, Y., Spurgeon, S.R., Wang, L., Kepaptsoglou, D., Crumlin, E.J., Ramasse, Q.M., and S.A. Chambers. **“Chemical and electronic structure analysis of a SrTiO₃ (001) / p -Ge (001) hydrogen evolution photocathode.”** *MRS Communications*. 8.2 (2018): 446–452. DOI:10.1557/mrc.2018.38
- Kaspar, T.C., Hong, S., Bowden, M.E., Varga, T., Yan, P., Wang, C.-M., Spurgeon, S.R., Comes, R.B., Ramuhalli, P., and C.H. Henager. **“Tuning piezoelectric properties through epitaxy of La₂Ti₂O₇ thin films.”** *Scientific Reports*. 8 (2018): 3037. DOI:10.1038/s41598-018-21009-5
- 2017 Spurgeon, S.R., Sushko, P.V., Comes, R.B., and S.A. Chambers. **“Dynamic interface rearrangement in LaFeO₃ / n -SrTiO₃ heterojunctions.”** *Physical Review Materials*. 1 (2017): 063401. DOI:10.1103/PhysRevMaterials.1.063401
- Jiang, W., Spurgeon, S.R., Liu, J., Schreiber, D.K., Jung, H.J., Devaraj, A., Edwards, D.J., Henager, C.H., Kurtz, R.J., and Y. Wang. **“Precipitates and voids in cubic silicon carbide implanted with ²⁵Mg⁺ ions.”** *Journal of Nuclear Materials*. 498 (2018): 321–331. DOI:10.1016/j.jnucmat.2017.10.046
- Du, Y., Li, C., Zhang, K.H.L., McBriarty, M., Spurgeon, S.R., Mehta, H.S., Wu, D., and S.A. Chambers. **“An all-perovskite p - n junction based on transparent conducting p -La_{1- x} Sr _{x} CrO₃ epitaxial layers.”** *Applied Physics Letters*. 111.6 (2017): 063501. DOI:10.1063/1.4997410
- Comes, R.B., Perea, D., and S.R. Spurgeon. **“Heterogeneous two-phase pillars in epitaxial NiFe₂O₄-LaFeO₃ nanocomposites.”** *Advanced Materials Interfaces*. 1700396 (2017). DOI:10.1002/admi.201700396
- Spurgeon, S.R., Du, Y., and S.A. Chambers. **“Measurement error in atomic-scale scanning transmission electron microscopy–energy-dispersive X-ray spectroscopy (STEM-EDS) mapping of a model oxide interface.”** *Microscopy and Microanalysis*. 23.3 (2017): 513–517. DOI:10.1017/S1431927617000368
- Kaspar, T., Gigax, J., Shao, L., Bowden, M.E., Varga, T., Shutthanandan, V., Spurgeon, S.R., Yan, P., Wang, C.M., Ramuhalli, P., and C. Henager. **“Damage evolution of ion irradiated defected-fluorite La₂Zr₂O₇ epitaxial thin films.”** *Acta Materialia*. 130 (2017): 111–120. DOI:10.1016/j.actamat.2017.01.012
- Chambers, S.A., Du, Y., Comes, R.B., Spurgeon, S.R., and P.V. Sushko. **“The effects of core-level broadening in determining band alignment at the epitaxial SrTiO₃ (001) / p -Ge (001) heterojunction.”** *Applied Physics Letters*. 110.9 (2017): 082104. DOI:10.1063/1.4977422
- Stoerzinger, K.A., Comes, R.B., Spurgeon, S.R., Thevuthasan, S., Ihm, K., Crumlin, E.J., and S.A. Chambers. **“Influence of LaFeO₃ surface termination on water reactivity.”** *Journal of Physical Chemistry Letters*. 8 (2017): 1038–1043. DOI:10.1021/acs.jpcclett.7b00195

- Comes, R.B., Spurgeon, S.R., Kepaptsoglou, D.M., Engelhard, M.H., Perea, D.E., Kaspar, T.C., Ong, P.V., Ramasse, Q.M., Sushko, P.V., and S.A. Chambers. “**Probing the origin of interfacial carriers in SrTiO₃ – LaCrO₃ superlattices.**” *Chemistry of Materials*, 29.3 (2017): 1147–1155. DOI:10.1021/acs.chemmater.6b04329
- 2016 Spurgeon, S.R., Du, Y., Droubay, T., Devaraj, A., Sang, X., Longo, P., Yan, P., Kotula, P.G., Shutthanandan, V., Bowden, M.E., LeBeau, J.M., Wang, C., Sushko, P.V., and S.A. Chambers. “**Competing pathways for nucleation of the double perovskite structure in the epitaxial synthesis of La₂MnNiO₆.**” *Chemistry of Materials*, 28.11 (2016): 3814–3822. DOI:10.1021/acs.chemmater.6b00829
- Comes, R.B., Spurgeon, S.R., Heald, S.M., Kepaptsoglou, D.M., Jones, L., Ong, P.V., Bowden, M.E., Ramasse, Q.M., Sushko, P.V., and S.A. Chambers. “**Interface-induced polarization in SrTiO₃ – LaCrO₃ superlattices.**” *Advanced Materials Interfaces*, 3.10 (2016): 1500779. DOI:10.1002/admi.201500779
- Li, X., Ma, C.T., Lu, J., Devaraj, A., Spurgeon, S.R., Comes, R.B., and S.J. Poon. “**Exchange bias and bistable magneto-resistance states in amorphous TbFeCo thin films.**” *Applied Physics Letters*, 108.1 (2016): 012401. DOI:10.1063/1.4939240
- Kaspar, T.C., Schreiber, D.K., Spurgeon, S.R., McBriarty, M.E., Carroll, G.M., Gamelin, D.R., and S.A. Chambers. “**Built-in potential in Fe₂O₃ – Cr₂O₃ superlattices for improved photoexcited carrier separation.**” *Advanced Materials*, 28.8 (2016):1616–1622. DOI:10.1002/adma.201504545
- 2015 Spurgeon, S.R., Balachandran, P.V., Kepaptsoglou, D.M., Damodaran, A.R., Karthik, J., Nejati, S., Jones, L., Ambaye, H., Lauter, V., Ramasse, Q.M., Lau, K.K.S., Martin, L.W., Rondinelli, J.M., and M.L. Taheri. “**Polarization screening-induced magnetic phase gradients at complex oxide interfaces.**” *Nature Communications*, 6 (2015): 6735. DOI:10.1038/ncomms7735
- 2014 Spurgeon, S.R., Sloppy, J.D., Kepaptsoglou, D.M., Balachandran, P.V., Nejati, S., Karthik, J., Damodaran, A.R., Johnson, C.L., Ambaye, H., Goyette, R., Lauter, V., Ramasse, Q.M., Idrobo, J.C., Lau, K.K.S., Lofland, S.E., Rondinelli, J.M., Martin, L.W., and M.L. Taheri. “**Thickness-dependent crossover from charge- to strain-mediated magnetoelectric coupling in ferromagnetic / piezoelectric oxide heterostructures.**” *ACS Nano*, 8.1. (2014): 894–903. DOI:10.1021/nn405636c
- 2012 Spurgeon, S.R., Sloppy, J.D., Tao, R., Klie, R.F., Lofland, S.E., Baldwin, J.K., Misra, A., and M.L. Taheri. “**A study of the effect of iron island morphology and interface oxidation on the magnetic hysteresis of Fe – MgO (001) thin film composites.**” *Journal of Applied Physics*, 112 (2012): 013905. DOI:10.1063/1.4730630
- Carroll, K.J., Huba, Z., Spurgeon, S.R., Qian, M., Khanna, S.N., Hudgins, D.M., Taheri, M.L., and E.E. Carpenter. “**Magnetic properties of Co₂C and Co₃C nanoparticles and their assemblies.**” *Applied Physics Letters*, 101 (2012): 012409. DOI:10.1063/1.4733321
- 2010 Carroll, K.J., Hudgins, D.M., Spurgeon, S., Kemner, K.M., Mishra, B., Boyanov, M.I., Brown, L.W., Taheri, M.L., and E.E. Carpenter. “**One-pot aqueous synthesis of Fe and Ag core/shell nanoparticles.**” *Chemistry of Materials*, 22.23 (2010): 6291–6296. DOI:10.1021/cm101996u
- 2008 Havelia, S., Balasubramaniam, K., Spurgeon, S., Cormack, F., and P. Salvador. “**Growth of La₂Ti₂O₇ and LaTiO₃ thin films using pulsed laser deposition.**” *Journal of Crystal Growth*, 310.7–9 (2008): 1985–1990. DOI:10.1016/j.jcrysgro.2007.12.006

Book Chapters

- 2022 S.R. Spurgeon. “**Scanning transmission electron microscopy of oxide interfaces and heterostructures.**” *Materials Characterization Methods for Epitaxial Films and Heterostructures*, World Scientific Publishing. (2022). In press.
- 2018 Spurgeon, S.R. and S.A. Chambers. “**Atomic-scale characterization of oxide interfaces and superlattices using scanning transmission electron microscopy.**” *Encyclopedia of Interfacial Chemistry: Surface Science and Electrochemistry*, Elsevier. (2018) 38–48. DOI:10.1016/B978-0-12-409547-2.12877-X

Book Reviews

Presentations

Invited Talks

1. S.R. Spurgeon. “**Realizing the Artificial Intelligence-Driven Future of Electron Microscopy .**” Seagate AI/ML Virtual Distinguished Speaker Series. Online webinar. 11 Feb 2022.
2. S.R. Spurgeon. “**Atomistic engineering of the energy materials of the future.**” Materials Challenges in Alternative and Renewable Energy 2021. Online webinar. 21 Jul 2021.
3. S.R. Spurgeon. “**Designing novel functional materials through data-infused microscopy.**” Microscience Microscopy Congress 2021. Online webinar. 7 Jul 2021.
4. S.R. Spurgeon. “**Rapid and flexible few shot learning-based classification of scanning transmission electron microscopy data.**” Electronic Materials Conference 2021. Online webinar. 24 Jun 2021.
5. S.R. Spurgeon. “**Shaping the atomic world: the data-driven future of materials science.**” University of Washington Undergraduate Engineering Seminar Series. Online webinar. 29 Apr 2021.
6. S.R. Spurgeon. “**Progress toward rapid, statistical scanning transmission electron microscopy.**” Autonomous Discovery in Science and Engineering Workshop. Online webinar. 22 Apr 2021.
7. S.R. Spurgeon. “**Harnessing the energy materials of the future one atom at a time.**” American Nuclear Society Eastern Washington Chapter Meeting. Online webinar. 16 Mar 2021.
8. S.R. Spurgeon. “**Next-generation materials discovery and design enabled by data-infused electron microscopy.**” University of Nebraska – Lincoln NCMN Seminar. Online webinar. 3 Mar 2021.
9. S.R. Spurgeon. “**Exploring the world of nanomaterials defects through atomic-scale electron microscopy.**” Indiana University – Purdue University Mechanical Engineering Department Seminar. Online webinar. 25 Feb 2021.
10. S.R. Spurgeon. “**A window into order-disorder processes at oxide interfaces.**” Electronic Materials & Applications Conference. Online webinar. 19 Jan 2021.
11. S.R. Spurgeon. “**Harnessing atomistic defects to advance materials discovery and design.**” University of Washington Physics Department Seminar. Online webinar. 10 Dec 2020.
12. S.R. Spurgeon. “**Unlocking the materials of the future through atomic-scale electron microscopy.**” Trinity College–Dublin. Online webinar. 23 Jul 2020.
13. S.R. Spurgeon. “**Advancing materials design and discovery through atomic-scale electron microscopy.**” National Institute of Standards and Technology. Boulder, CO. 6 Jan 2020.
14. S.R. Spurgeon. “**Modern-day alchemy: Engineering the future atom-by-atom.**” Washington State University Tri-Cities Engineering Seminar Series. Richland, WA. 22 Feb 2019.
15. S.R. Spurgeon, M. Sassi, J. Stubbs, E. Ilton, and E. Buck. “**Atomic-scale structural and chemical investigation of UO₂ surface oxidation.**” ACS Northwest Regional Meeting. Richland, WA. 25 Jun 2018.
16. S.R. Spurgeon. “**Development of an integrated TEM platform.**” D-ITEM Meeting. Telluride, CO. 19 Jun 2018.
17. S.R. Spurgeon. “**Nano to meso: Pushing the limits of atomic-scale materials analysis.**” Nion. Co. Kirkland, WA. 17 Mar 2018.
18. S.R. Spurgeon. “**Nano to meso: Pushing the limits of atomic-scale materials analysis.**” PNNL Physical Sciences Division Fall Seminar Series. Richland, WA. 5 Oct 2016.
19. Spurgeon, S.R. “**Static and dynamic studies of charge- and strain-mediated magnetoelectric coupling in ferromagnetic / piezoelectric oxide heterostructures using PNR and TEM.**” Pacific Northwest National Laboratory. Richland, WA. 27 Jun 2014.

20. Spurgeon, S.R. “**Static and dynamic studies of charge- and strain-mediated magnetoelectric coupling in ferromagnetic / piezoelectric oxide heterostructures using PNR and TEM.**” National Institute of Standards and Technology, Center for Neutron Research. Gaithersburg, MD. 10 Feb 2014.

Contributed Talks

1. S.R. Spurgeon. “**A Vision for the Data-Guided Future of Electron Microscopy.**” PNNL TechFest 2021. Online webinar. 12 Jul 2021.
2. S.R. Spurgeon, M. Sassi, T. Kaspar, W. Jiang, and V. Shutthanandan. “**Atomic-scale mechanisms for interfacial radiation damage resistance of thin film oxide heterostructures.**” Microscopy and Microanalysis Conference. Portland, OR. 7 Aug 2019.
3. S.R. Spurgeon, M. Sassi, J. Stubbs, E. Ilton, and E. Buck. “**Atomic-scale electron energy loss spectroscopy of uraninite UO₂ surface oxidation.**” ACS Northwest Regional Meeting. Portland, OR. 18 Jun 2019.
4. S.R. Spurgeon, M. Sassi, T. Kaspar, W. Jiang, and V. Shutthanandan. “**Atomic-Scale mechanisms for interfacial radiation damage resistance of oxide heterostructures.**” Materials Research Society Spring Meeting. Phoenix, AZ. 24 Apr 2019.
5. S.R. Spurgeon, M. Sassi, T. Kaspar, and V. Shutthanandan. “**Atomic-scale mechanisms for interfacial damage resistance in ion-irradiated La₂Ti₂O₇ / SrTiO₃ thin film heterostructures.**” Electronic Materials and Applications. Orlando, FL. 24 Jan 2019.
6. S.R. Spurgeon, M. Sassi, T. Kaspar, W. Jiang, and V. Shutthanandan. “**Nanoscale evolution of amorphization in ion-irradiated La₂Ti_{2-x}Zr_xO₇ thin film heterojunctions.**” ACS Northwest Regional Meeting. Portland, OR. 18 Jun 2019.
7. S.R. Spurgeon, M. Sassi, J. Stubbs, E. Ilton, and E. Buck. “**Examination of UO₂ surface oxidation using atomic-scale electron energy loss spectroscopy.**” NuMat 2018. Seattle, WA. 16 Oct 2018.
8. Spurgeon, S.R., Sassi, M., Kaspar, T., and V. Shutthanandan. “**Defect formation and interfacial damage resistance in ion-irradiated La₂Ti_{2-x}Zr_xO₇ Thin Films.**” ACS Northwest Regional Meeting. Richland, WA. 26 Jun 2018.
9. Spurgeon, S.R., Sassi, M., Kaspar, T., and V. Shutthanandan. “**Effect of cation substitution on defect generation and damage tolerance in ion-irradiated La₂Ti_{2-x}Zr_xO₇ thin films.**” Materials Research Society Spring Meeting. Phoenix, AZ. 3 Apr 2018.
10. Spurgeon, S.R., Sushko, P.V., Comes, R.B., and S.A. Chambers. “**Dynamic interface rearrangement in LaFeO₃ / n-SrTiO₃ heterojunctions.**” Materials Research Society Spring Meeting. Phoenix, AZ. 3 Apr 2018.
11. Spurgeon, S.R., Kepaptsoglou, D.M., Jones, L., Comes, R.B., Ramasse, Q.M., Ong, P.-V., Sushko, P.V., and S.A. Chambers. “**Correlative aberration-corrected STEM-HAADF and STEM-EELS analysis of interface-induced polarization in LaCrO₃-SrTiO₃ superlattices.**” American Vacuum Society Pacific Northwest Chapter Meeting. Richland, WA. 15 Sep 2016.
12. Spurgeon, S.R., Du, Y., Droubay, T., Devaraj, A., Sang, X., Longo, P., Yan, P., Kotula, P.G., Shutthanandan, V., Bowden, M.E., LeBeau, J.M., Wang, C., Sushko, P.V., and S.A. Chambers. “**Multidimensional analysis of local compositional and valence fluctuations in the model complex oxide La₂MnNiO₆.**” European Microscopy Congress. 31 Aug 2016. DOI:10.1002/9783527808465.EMC2016.4647
13. Spurgeon, S.R., Kepaptsoglou, D.M., Jones, L., Comes, R.B., Ramasse, Q.M., Ong, P.-V., Sushko, P.V., and S.A. Chambers. “**Monochromated STEM-EELS analysis of interface-induced polarization in LaCrO₃-SrTiO₃ superlattices.**” European Microscopy Congress. 30 Aug 2016. DOI:10.1002/9783527808465.EMC2016.6257
14. Spurgeon, S.R., Kepaptsoglou, D.M., Jones, L., Comes, R.B., Ramasse, Q.M., Ong, P.-V., Sushko, P.V., and S.A. Chambers. “**Correlative aberration-corrected STEM-HAADF and STEM-EELS analysis of interface-induced polarization in LaCrO₃-SrTiO₃ superlattices.**” Microscopy and Microanalysis Conference. Columbus, OH. 27 Jul 2016. DOI:10.1017/S143192761600845X
15. Spurgeon, S.R., Du, Y., Droubay, T., Devaraj, A., Sang, X., Longo, P., Yan, P., Kotula, P.G., Shutthanandan, V., Bowden, M.E., LeBeau, J.M., Wang, C., Sushko, P.V., and S.A. Chambers. “**Multidimensional analysis of nanoscale phase separation in complex materials systems.**” Microscopy and Microanalysis Conference. Columbus, OH. 26 Jul 2016. DOI:10.1017/S1431927616002269

16. Spurgeon, S.R., Du, Y., Droubay, T., Devaraj, A., Sang, X., Longo, P., Yan, P., Kotula, P.G., Shutthanandan, V., Bowden, M.E., LeBeau, J.M., Wang, C., Sushko, P.V., and S.A. Chambers. **“Multiscale characterization of chemical ordering and extended defects in the double perovskite oxide $\text{La}_2\text{MnNiO}_6$.”** Materials Research Society Spring Meeting. Phoenix, AZ. 31 Mar 2016.
17. Kaspar, T., Schreiber, D.K., Spurgeon, S.R., and S.A. Chambers. **“Built-in potential in Fe_2O_3 - Cr_2O_3 superlattices for improved photoexcited carrier separation.”** American Vacuum Society International Symposium, 19 Oct 2015.
18. Spurgeon, S.R., McDonald, I.J., Huang, E., Vasudevan, R., Lofland, S.E., Kirby, B.J., Valanoor, N., and M.L. Taheri. **“In situ electrical biasing studies of interfacial magnetoelectric coupling in $\text{La}_{1-x}\text{Sr}_x\text{MnO}_3$ - $\text{PbZr}_x\text{Ti}_{1-x}\text{O}_3$ thin film oxide heterostructures.”** American Physical Society March Meeting, 3 Mar 2014.
19. Spurgeon, S.R., McDonald, I.J., Huang, E., Vasudevan, R., Lofland, S.E., Kirby, B.J., Valanoor, N., and M.L. Taheri. **“In situ electrical biasing studies of interfacial magnetoelectric coupling in $\text{La}_{1-x}\text{Sr}_x\text{MnO}_3$ - $\text{PbZr}_x\text{Ti}_{1-x}\text{O}_3$ thin film oxide heterostructures.”** Materials Research Society Fall Meeting, 2 Dec 2013.
20. Spurgeon, S.R., Sloppy, J.D., Kepaptsoglou, D.M., Balachandran, P.V., Nejati, S., Karthik, J., Damodaran, A.R., Johnson, C.L., Ambaye, H., Goyette, R., Lauter, V., Ramasse, Q.M., Idrobo, J.C., Lau, K.K.S., Lofland, S.E., Rondinelli, J.M., Martin, L.W., and M.L. Taheri. **“Thickness-dependent crossover from charge- to strain-mediated magnetoelectric coupling in ferromagnetic/piezoelectric oxide heterostructures.”** Materials Research Society Fall Meeting, 3 Dec 2013.
21. Jablonski, M., Spurgeon, S.R., Marshall, M.S.J., Arredondo, M., Ahn, C.H., Martin, L.W., and M.L. Taheri. **“In situ transmission electron microscopy studies of domain wall motion in ferroelectric perovskite oxides.”** Materials Research Society Fall Meeting, 4 Dec 2013.
22. Spurgeon, S.R., Sloppy, J.D., Kepaptsoglou, D.M., Balachandran, P.V., Nejati, S., Karthik, J., Damodaran, A.R., Johnson, C.L., Ambaye, H., Goyette, R., Lauter, V., Ramasse, Q.M., Idrobo, J.C., Lau, K.K.S., Lofland, S.E., Rondinelli, J.M., Martin, L.W., and M.L. Taheri. **“A combined TEM, STEM-EELS, and neutron reflectometry study of charge- and strain-mediated magnetoelectric coupling in LSMO/PZT thin-film heterostructures.”** Materials Science and Technology Conference, 8 Oct 2012.
23. Spurgeon, S.R., Sloppy, J.D., Kepaptsoglou, D.M., Balachandran, P.V., Nejati, S., Karthik, J., Damodaran, A.R., Johnson, C.L., Ambaye, H., Goyette, R., Lauter, V., Ramasse, Q.M., Idrobo, J.C., Lau, K.K.S., Lofland, S.E., Rondinelli, J.M., Martin, L.W., and M.L. Taheri. **“A combined TEM, STEM-EELS, and neutron reflectometry study of charge- and strain-mediated magnetoelectric coupling in LSMO/PZT heterostructures.”** Microscopy and Microanalysis Conference, 2 Aug 2012. DOI:10.1017/S1431927612011415
24. Spurgeon, S.R., Sloppy, J.D., Nejati, S., Karthik, J., Damodaran, A.R., Johnson, C.L., Ambaye, H., Goyette, R., Lauter, V., Idrobo, J.C., Lau, K.K.S., Lofland, S.E., Martin, L.W., and M.L. Taheri. **“A polarized neutron and transmission electron microscopy study of magnetoelectric coupling in thin film PZT-LSMO heterostructures.”** American Conference on Neutron Scattering, 25 Jun 2012.
25. Spurgeon, S.R., Sloppy, J.D., Nejati, S., Karthik, J., Damodaran, A.R., Johnson, C.L., Ambaye, H., Goyette, R., Lauter, V., Idrobo, J.C., Lau, K.K.S., Lofland, S.E., Martin, L.W., and M.L. Taheri. **“A study of strain- and charge-mediated magnetoelectric coupling in PZT-LSMO heterostructures using transmission electron microscopy and polarized neutron reflectometry.”** Materials Research Society Fall Meeting, 29 Nov 2011.
26. Spurgeon, S.R., Lofland, S.E., Misra, A., and M.L. Taheri. **“A study of the interfacial magnetic and atomic structure of oxide-coated ferrous powder metals.”** PowderMet Conference, 20 May 2011.
27. Spurgeon, S.R., Winkler, C.R., Kirby, B.J., and M.L. Taheri. **“A multi-scale analysis of the structural and magnetic properties of oxide coatings for iron powders used in electromagnetic applications.”** PowderMet Conference, 29 Jun 2010.
28. S.R. Spurgeon. **“Engineering anisotropic lyotropic liquid crystal nano-architectures.”** National Science Foundation Research Experiences for Undergraduates Program. University of Colorado, 9 Aug 2007.

Poster Presentations

1. S.R. Spurgeon, M. Sassi, C. Ophus, J. Stubbs, E. Ilton, and E. Buck. **“Nanoscale quantification of interstitial oxygen in hyperstoichiometric UO_{2+x} .”** Microscopy and Microanalysis. Portland, OR. 6 Aug 2019.

2. S.R. Spurgeon, M. Sassi, T.C. Kaspar, S. Reehl, B. Stanfill, B. Matthews, W. Jiang, V. Shutthanandan, and K.M. Rosso. **“Damage mechanisms and defect formation in irradiated model systems.”** *Millennial Nuclear Caucus*. Richland, WA. 4 Apr 2019.
3. S.R. Spurgeon, A. Devaraj, B. Matthews, P. Sushko, C. Thomas, M., Manfra, M. Thomas, J. Gamble. **“Advanced characterization of quantum materials systems.”** *Northwest Quantum Nexus Summit*. Seattle, WA. 19 Mar 2019.
4. S.R. Spurgeon, M. Sassi, T.C. Kaspar, V. Shutthanandan, and K.M. Rosso. **“Atomic-scale imaging of interfacial damage evolution in ion-irradiated $\text{La}_2\text{Ti}_{2-x}\text{Zr}_x\text{O}_7$ thin films.”** *NuMat 2018*. Seattle, WA. 17 Oct 2018.
5. Spurgeon, S.R., Sushko, P.V., Devaraj, A., Du, Y. Droubay, T., and S.A. Chambers. **“Multiscale analysis of cation disorder and oxygen deficiency-mediated phase separation in double perovskite oxides.”** *Advances in Structural and Chemical Imaging Workshop*, 23 May 2017.
6. Spurgeon, S.R., Sushko, P.V., Devaraj, A., Du, Y. Droubay, T., and S.A. Chambers. **“Oxygen transport-driven suppression of phase separation in the double perovskite oxide $\text{La}_2\text{MnNiO}_6$.”** *Materials Research Society Spring Meeting*, 18 Apr 2017.
7. Spurgeon, S.R., Du, Y. and S.A. Chambers. **“Atomically-resolved chemical mapping of a model oxide interface: Challenges and insights.”** *Advances in Structural and Chemical Imaging Workshop*, 19 May 2016.
8. Comes R.B., Lin, S.C., Kuo, C.T., Heald, S.M., Spurgeon, S.R., Kepaptsoglou, D.M., Ramasse, Q.M., Rault, J., Nemsak, S., Fadley, C.S., Sushko, P.V., and S.A. Chambers. **“Probing electronic structure and polarization in SrTiO_3 - LaCrO_3 superlattices using X-ray spectroscopy.”** *Materials Research Society Spring Meeting*, 30 Mar 2016.
9. Spurgeon, S.R., Jones, L., Kepaptsoglou, D.M., Comes, R.B., Ramasse, Q.M., and S.A. Chambers. **“Measuring local ferroelectric polarization using aberration-corrected STEM-HAADF imaging and non-rigid image correction routines.”** *Advances in Structural and Chemical Imaging Workshop*, 21 May 2015.
10. Spurgeon, S.R., Sloppy, J.D., Kepaptsoglou, D.M., Balachandran, P.V., Nejati, S., Karthik, J., Damodaran, A.R., Johnson, C.L., Ambaye, H., Goyette, R., Lauter, V., Ramasse, Q.M., Idrobo, J.C., Lau, K.K.S., Lofland, S.E., Rondinelli, J.M., Martin, L.W., and M.L. Taheri. **“Evidence for a thickness-dependent crossover from charge- to strain-mediated magnetoelectric coupling in $\text{La}_{0.7}\text{Sr}_{0.3}\text{MnO}_3$ / $\text{PbZr}_{0.2}\text{Ti}_{0.8}\text{O}_3$ thin film oxide heterostructures.”** *Microscopy and Microanalysis Conference*, 8 Aug 2013. DOI:110.1017/S1431927613011811
11. Spurgeon, S.R., Sloppy, J.D., Kepaptsoglou, D.M., Balachandran, P.V., Nejati, S., Karthik, J., Damodaran, A.R., Johnson, C.L., Ambaye, H., Goyette, R., Lauter, V., Ramasse, Q.M., Idrobo, J.C., Lau, K.K.S., Lofland, S.E., Rondinelli, J.M., Martin, L.W., and M.L. Taheri. **“Thickness-dependent crossover from charge- to strain-mediated magnetoelectric coupling in $\text{La}_{0.7}\text{Sr}_{0.3}\text{MnO}_3$ / $\text{PbZr}_{0.2}\text{Ti}_{0.8}\text{O}_3$ thin film heterostructures.”** *Drexel University Research Day*, 18 Apr 2013.
12. Spurgeon, S.R., Sloppy, J.D., Kepaptsoglou, D.M., Balachandran, P.V., Nejati, S., Karthik, J., Damodaran, A.R., Johnson, C.L., Ambaye, H., Goyette, R., Lauter, V., Ramasse, Q.M., Idrobo, J.C., Lau, K.K.S., Lofland, S.E., Rondinelli, J.M., Martin, L.W., and M.L. Taheri. **“A local study of magnetoelectric coupling in PZT-LSMO thin film heterostructures using transmission electron microscopy and polarized neutron reflectometry.”** *American Physical Society March Meeting*, 21 Mar 2013.
13. McDonald, I.J, Spurgeon, S.R., Beckett, D., May, S.J., and M.L. Taheri. **“Development of a unique surface magneto-optical Kerr magnetometer to study correlation of magnetism and structure at iron / oxide interfaces.”** *PowderMet Conference*, 11 Jun 2012.
14. Kriete, A.S., Sparber, B.A., Spurgeon, S.R., Hanejko, F.J., and M.L. Taheri. **“The effect of sintering dynamics on additive diffusion in ferrous powder metal compacts.”** *PowderMet Conference*, 11 Jun 2012.
15. McDonald, I.J, Spurgeon, S.R., Beckett, D., May, S.J., and M.L. Taheri. **“Development of a unique surface magneto-optical Kerr effect magnetometer to correlate magnetism and structure in coated ferrous thin films and powders.”** *Materials Research Society Fall Meeting*, 29 Nov 2011.
16. Taheri, M.L., Winkler, C.R., Sloppy, J.D., Spurgeon, S.R., Martin, L.W., Idrobo, J.C., Phatak, C., Wen, J., and D.J. Miller. **“A quantitative understanding of domain relaxation behavior in BiFeO_3 -based multiferroic systems using *in situ* TEM.”** *Materials Research Society Fall Meeting*, 28 Nov 2011.
17. Spurgeon, S.R., Sloppy, J.D, Lofland, S.E., Baldwin, J.K., Misra, A., and M.L. Taheri. **“The effect of film morphology and interface structure on the magnetic properties of Fe - MgO (001) thin films.”** *Microscopy and Microanalysis Conference*, 9 Aug 2011. DOI:10.1017/S1431927611008099

18. Sloppy, J.D., Idrobo, J.C., Sundaram, S., Spurgeon, S.R., Winkler, C.R., Valanoor, N., Munroe, P., and M.L. Taheri. **“Interfacial chemistry, defects, and strain in multiferroic heterostructures.”** *Microscopy and Microanalysis Conference*, 10 Aug 2011. DOI:10.1017/S1431927611007781
19. Sparber, B.A., Spurgeon, S.R., Hanejko, F.J., and M.L. Taheri. **“A study of additive diffusion in ferrous powder metal compacts using scanning electron microscopy and energy dispersive X-ray spectroscopy.”** *PowderMet Conference*, 19 May 2011.
20. Spurgeon, S.R., Kikkawa, J., Baldwin, J.K., Misra, A., and M.L. Taheri. **“A structural and magnetic study of interfacial spin coupling in Fe–MgO ferromagnetic-dielectric thin film composites.”** *Materials Research Society Fall Meeting*, 19 Nov 2010.
21. Barr, C.M., Vetterick, G., Scotto D’Antuono, D., Winkler, C.R., Spurgeon, S.R., Kirk, M.A., Knight, R., and M.L. Taheri. **“Multi-scale examination of the effect of $\Sigma 3_n$ CSL boundaries on radiation-induced degradation in stainless steels.”** *Materials Research Society Fall Meeting*, 19 Nov 2010.
22. Spurgeon, S.R., Winkler, C.R., Kirby, B.J., Johnson, C.L., and M.L. Taheri. **“Correlating interfacial structure and magnetism in Fe–MgO thin films using electron microscopy, X-ray and neutron reflectometry.”** *Microscopy and Microanalysis Conference*, 3 Aug 2010.
23. Spurgeon, S.R., Winkler, C.R., Kirby, B.J., Johnson, C.L., Atthipalli, G., Gray, J., and M.L. Taheri. **“A multiscale correlation of the structural and magnetic properties of complex metal oxide thin film composites.”** *Materials Research Society Spring Meeting*, 6 Apr 2010.

MRS Bulletin Publications

1. S. Spurgeon. **“Single chip integrates transistors and photonic components.”** *Materials Research Society Bulletin*, 41 (2016): 180-2. DOI:10.1557/mrs.2016.37
2. S. Spurgeon. **“SPM scans the chemical landscape of manganite oxides”** *Materials Research Society Bulletin*, 40 (2015): 465-6. DOI:10.1557/mrs.2015.126
3. S. Spurgeon. **“‘Paper Factory’ produces blend of science and engineering education.”** *Materials Research Society Bulletin*, 39 (2014): 945-6. DOI:10.1557/mrs.2014.268
4. S. Spurgeon. **“Navy SeaPerch competition spreads STEM awareness.”** *Materials Research Society Bulletin*, 38 (2013): 780. DOI:10.1557/mrs.2013.246
5. S. Spurgeon. **“Electric field utilized to locally pin magnetic domain walls.”** *Materials Research Society Bulletin*, 38 (2013): 598. DOI:10.1557/mrs.2013.190
6. S. Spurgeon. **“Epitaxial strain tunes spintronic behavior of BiFeO₃.”** *Materials Research Society Bulletin*, 38 (2013): 529. DOI:10.1557/mrs.2013.164
7. S. Spurgeon. **“Superdiffusive electron transport mediates laser-induced demagnetization.”** *Materials Research Society Bulletin*, 38 (2013): 296. DOI:10.1557/mrs.2013.89
8. S. Spurgeon. **“Drexel hosts Philly Materials Day.”** *Materials Research Society Bulletin*, 37 (2012): 888-889. DOI:10.1557/mrs.2012.261
9. S. Spurgeon. **“Spin bag model proposed for room-temperature ferromagnetism in Sr₃YCo₄O_{10+δ}.”** *Materials Research Society Bulletin*, 37 (2012): 881. DOI:10.1557/mrs.2012.244
10. S. Spurgeon. **“Inverse spin Hall effect observed in silicon.”** *Materials Research Society Bulletin*, 37 (2012): 186. DOI:10.1557/mrs.2012.69
11. S. Spurgeon. **“Functional ferroelectric tunnel-junction memories demonstrated.”** *Materials Research Society Bulletin*, 37 (2012): 101. DOI:10.1557/mrs.2012.15
12. S. Spurgeon. **“Room-temperature electrical control of ferromagnetic ordering in cobalt demonstrated.”** *Materials Research Society Bulletin*, 36 (2011): 953. DOI:10.1557/mrs.2011.316
13. S. Spurgeon. **“Thin-film heterostructures of Fe- and Co-BaTiO₃ exhibit interface multiferroicity at room temperature.”** *Materials Research Society Bulletin*, 36 (2011): 843. DOI:10.1557/mrs.2011.282

14. S. Spurgeon. “SPM reveals nanoscale understanding of oxygen reactions in fuel cells and batteries.” *Materials Research Society Bulletin*, 36 (2011): 741. DOI:10.1557/mrs.2011.248
15. S. Spurgeon. “A (111)-ordered Sr₂FeRuO₆ superlattice displays room-temperature magnetic ordering.” *Materials Research Society Bulletin*, 36 (2011): 478. DOI:10.1557/mrs.2011.161
16. S. Spurgeon. “Modified SPM allows high resolution mapping of lithium-ion diffusion.” *Materials Research Society Bulletin*, 35 (2010): 836. DOI:10.1557/mrs2010.723