

James R. Neilson

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Research Vision

My research pertains to solid-state and materials chemistry; my interest lies in discovering and understanding emergent properties and reactivity of materials to achieve a paradigm of materials design. As materials are key enablers of technology, the goal of this research is to discover and design new functionality in materials, *i.e.*, control macroscopic electronic and magnetic properties through the competition of local interactions in materials. While we primarily perform experiments to make materials, characterize their structure and properties, we gain additional insight through numerical calculations and simulations.

Academic Positions

2022-2023 Visiting Professor, Inorganic Chemistry Laboratory, Department of Chemistry; University of Oxford, Oxford, United Kingdom.

2019–current Associate Professor, Department of Chemistry; Colorado State University, Fort Collins, CO.

2021–current Associate Professor, School of Advanced Materials Discovery; Colorado State University, Fort Collins, CO.

2013–2019 Assistant Professor, Department of Chemistry; Colorado State University, Fort Collins, CO.

2011–2013 Post-doctoral Associate, Department of Chemistry; Johns Hopkins University, Baltimore, MD

Education

2006–2011 Ph.D., Biomolecular Science & Engineering.

University of California Santa Barbara, Santa Barbara, CA USA.

Thesis title: *Kinetic Control of Aqueous Hydrolysis: Modulation of Structure/Property Relationships in Inorganic Crystals.*

Advisor: [Professor Daniel E. Morse.](#)

2005 Summer Undergraduate Research Fellowship.

University of Cambridge, Cambridge, U.K.

Research: *Vibrational properties of glasses.*

Advisor: [Professor Stephen R. Elliot.](#)

2002–2006 B.S., Materials Science & Engineering, June 2006. Minor in Spanish.

Lehigh University, Bethlehem, PA USA.

Research: *Chalcogenide glasses and Nanolithography.*

Advisor: [Professor Himanshu Jain.](#)

Awards

- 2022-2023, Leverhulme Visiting Professor, Leverhulme Trust (United Kingdom).
- American Chemical Society *Chemistry of Materials* Lectureship and Best Paper Award, 2018.
- Research Corporation for Science Advancement, Scialog: Advanced Energy Storage Team Awards, 2018.
- College of Natural Sciences, Colorado State University, *Early Career (Pre-Tenure) Faculty Excellence in Teaching and/or Mentoring Award*, 2017.
- Research Corporation for Science Advancement, Scialog Fellow: Advanced Energy Storage, 2017.
- Alfred P. Sloan Foundation, Sloan Research Fellowship, 2017-2019.
- Research Corporation for Science Advancement, Cottrell Scholar Award, 2017-2020.
- National Science Foundation, Early CAREER Award, 2017-2022.
- Department of Energy Early Career Award, 2016-2021.

Graduate / Undergraduate Awards

National Science Foundation, Graduate Research Fellowship, 2007-2010

MRS Graduate Student Award, Silver Medalist, 2010

Barry M. Goldwater Scholar, 2005

Group / Mentoring

Graduate Students: Total: 24, including alumni.

Current: Ren Borgia (2022–current, PhD, Chem). Corlyn Reiger (2022–current, PhD, Chem). Layton Rudolph, Jr. (2022–current, PhD, Chem). Autumn Peters (2021–current, PhD, Chem). Adrienne Smiley (2020–current, MS, Chem); Dominic Asebiah (2020–current, PhD, MSE); Gia Thinh Tran (2018–current, PhD, Chem);

Alumni: Brennan McBride (2019–2023, MS, Chem). Dr. Chris Rom (2017-2022, PhD, Chem) Dr. Alexandra Koegel (2017-2022, PhD, Chem). Emily Storck (2020-2023, MS, Chem). Crystal Lundgren (2020-2023, MS, Chem). Dr. Jewels M. Fallon (2016-2022; PhD, Chem,). Dr. Eve Mozur (2015–2020, PhD, Chem). Dr. Ethan Emerson (2015–2020, PhD, Chem); Dr. Paul Todd (2015–2020, PhD, Chem); Dr. Arnold Paeklar (2014–2020, PhD, Chem); Victoria Combs (2016–2019, Chem); Dr. Annalise Maughan (2013–2018, PhD, Chem); Mary Marisa (2013–2017, MS, Chem); Dr. Andrew Martinolich (2013–2017, PhD, Chem); Michael Tarne (2014–2017, MS, Chem); Loryn Killpack (2014–2016, MS, Chem); Greg Terho (2013–2014, MS, Chem).

Postdoctoral Associates: Total: 2, including alumni.

Current: Dr. Allison Wustrow (2019–current).

Alumni: Dr. Iain Oswald (2017–2019); Dr. Josh Kurzman (2013–2015).

Visiting Scholars: Prof. Takafumi Yamamoto (Tokyo Institute of Technology, Fall 2018); Prof. Kate Ross (CSU, 2014–2015); Prof. Catherine Oertel (Oberlin College, summers 2016, 2017).

Undergraduate Interns: Total: 20, including alumni.

Alumni: Aiden Pullen (2021–2022). Kenneth Szymanski (2021–2021). Brenna Sydow (2020–2020). Ben Wasinger (2018–2022). Logan Antrobus (2019–2020); Jose Rivera (2019–2021). Callan Knebel (2019–2020); Hyochul Ahn (2018-2019). Julia Trowbridge (2016–2020); Erik Rognerud (2016–2018); Matt Gorman, (2016–2018); Andrew Candia (2016–2017); Alex Milder (Haverford REU 2017); Kyle Peterson (2016–2017); David Boyle (JMU REU 2016); Mohammed Almaker (2016); Juliette Granger (2015–2016); J. James Allen (2014–2016); Mitchel Bordelon (2013–2016); Geordan Brickey (2013–2014).

Publications (updated August 24, 2023)

With DOI links where available. Also listed at: <http://sites.chem.colostate.edu/neilsonlab/research.html>
Citation tracking at: [Google Scholar](#).

Awarded US Patents:

1. J. R. Neilson, T. M McQueen, *Magnetocaloric materials for cryogenic liquification*. United States Patent, 9,568,223 (Feb 14, 2017). [USPTO]

Book Chapters:

1. A. Wustrow, J. R. Neilson*, *Metathesis Routes to Materials*, in *Comprehensive Inorganic Chemistry III*, Ed. J. Reedijk, K. R. Poepelmeier. Elsevier. (2023). 24-39 [doi]

In Press or Review (manuscripts available upon request; ‡ indicates CSU undergraduate co-author; * indicates corresponding author)

3. M. J. McDermott, B. C. McBride, C. Regier, G. T. Tran, Y. Chen, A. A. Corrao, M. C. Gallant, G. E. Kamm, C. J. Bartel, K. W. Chapman, P. G. Khalifah, G. Ceder, J. R. Neilson, K. A. Persson*. Assessing Thermodynamic Selectivity of Solid-State Reactions for the Predictive Synthesis of Inorganic Materials. *Submitted* (2023). [arXiv]
2. T. Ohmi, I. W. H. Oswald, J. R. Neilson*, N. Roth, S. Nishioka, K. Maeda, K. Fujii, M. Yashima, M. Azuma, T. Yamamoto*, Thiocyanate-Stabilized Pseudo-Cubic Perovskite $\text{CH}(\text{NH}_2)_2\text{PbI}_3$ from Coincident Columnar Defects Lattices. Accepted: *J. Am. Chem. Soc.*, (2023).
1. C. L. Rom, R. W. Smaha, C. A. Knebel, K. Heinselman, J. R. Neilson, S. R. Bauers, A. Zakutayev. Bulk and film synthesis pathways to ternary magnesium tungsten nitrides. *J. Mater. Chem. C*, (2023), Advance Article. [arXiv] [doi]

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92. C. L. Rom, R. W. Smaha, C. L. Melamed, R. R. Schnepf, K. N. Heinselman, J. S. Mangum, S.-J. Lee, S. Lany, L. T. Schelhas, A. L. Greenaway, J. R. Neilson, S. R. Bauers, J. S. Andrew*, A. C. Tamboli, Combinatorial synthesis of cation-disordered manganese tin nitride MnSnN_2 thin films with magnetic and semiconducting properties. *Chem. Mater.*, 2023, 35(7), 2936-2946. [arXiv] [doi]
91. J. R. Neilson*, M. J. McDermott, K. A. Persson*. Modernist materials synthesis: Finding thermodynamic shortcuts with hyperdimensional chemistry. *J. Mater. Res.*, 2023, 38, 2885-2893. [arXiv] [doi]
90. T. Ohmi, T. Miura, K. Shigematsu, A. A. Koegel, B. S. Newell, J. R. Neilson, T. Ikoma, M. Azuma, T. Yamamoto*. Temperature-induced structural transition in an organic-inorganic hybrid layered perovskite $(\text{MA})_2\text{PbI}_{2-x}\text{Br}_x(\text{SCN})_2$. *CrystEngComm*, 2022, 24, 5428-5434. [doi]
89. A. A. Koegel, I. W. H. Oswald, C. Rivera, S. L. Miller, M. J. Fallon, T. R. Prisk, C. M. Brown, J. R. Neilson*. Influence of Inorganic Layer Thickness on Methylammonium Dynamics in Hybrid Perovskite Derivatives. *Chem. Mater.*, 2022, 34(18), 8316-8323. [doi]
88. R. D. McAuliffe, G. Huang, D. Montiel, A. Mehta, R. C. Davis, V. Petrova, K. L. Browning, J. R. Neilson, P. Liu, K. Thornton, G. M. Veith*. Thin-Film Paradigm to Probe Interfacial Diffusion during Solid-State Metathesis Reactions. *Chem. Mater.*, 2022, 34(14), 6279-6287. [doi]

87. Z. Thatcher, C.-H. Liu, L. Yang, B. C. McBride, G. T. Tran, A. Wustrow, M. A. Karlsen, J. R. Neilson, D. B. Ravnsbæk, S. J. Billinge*, *nmfMapping*: a cloud-based web application for non-negative matrix factorization of powder diffraction and pair distribution function datasets. *Acta Cryst. Sec. A*, 2022, 78(3), 242-248. [doi]
86. A. Wustrow, M. J. McDermott, D. O’Nolan, C.-H. Liu, G. T. Tran, B. C. McBride, S. M. Vornholt, C. Feng, S. S. Dwaraknath, K. W. Chapman, S. J. L. Billinge, W. Sun, K. A. Persson, J. R. Neilson*, Reaction Selectivity in Cometathesis: Yttrium Manganese Oxides, *Chem. Mater.*, 2022, 34(1) 4694-4702. [doi]
85. J. R. Neilson, A. M. Fry-Petit, N. Drichko, M. B. Stone, A. Llobet, M. Balasubramanian, M. R. Suchomel, T. M. McQueen*, Dynamical Bond Formation in KNi_2Se_2 , *Z. Anorg. Allg. Chem.* (2022), e202200042. [doi]
84. A. A. Koegel, E. M. Mozur, I. W. H. Oswald, N. H. Jalarvo, T. R. Prisk, M. Tyagi, and J. R. Neilson*, Correlating Broadband Photoluminescence with Structural Dynamics in Layered Hybrid Halide Perovskites, *J. Am. Chem. Soc.*, 2022, 144(3), 1313–1322. [doi]
83. P.K. Todd, M. J. Fallon, J. R. Neilson, A. Zakutayev*, Two-Step Solid-State Synthesis of Ternary Nitride Materials, *ACS Materials Lett.*, (2021), 3, 1677-1683. [doi]
82. P. K. Todd[†], M. J. McDermott[†], C. L. Rom, A. A. Corrao, J. J. Denney, S. S. Dwaraknath, P. G. Khalifah, K. A. Persson, J. R. Neilson*, Selectivity in Yttrium Manganese Oxide Synthesis via Local Chemical Potentials in Hyperdimensional Phase Space, *J. Am. Chem. Soc.* (2021), 143(37), 15185-15194. [[†]: equal contributions]. [doi] [arXiv]
81. C. L. Rom, M. J. Fallon, A. Wustrow, A. L. Prieto, J. R. Neilson*, Bulk synthesis, structure, and electronic properties of magnesium zirconium nitride solid solutions. *Chem. Mater.* (2021), 33, 13, 5345–5354. [doi]
80. E. M. Mozur, J. R. Neilson*, Cation Dynamics in Hybrid Halide Perovskites. *Ann. Rev. Mat. Res.* (2021), 51, 269-291. [doi] [arXiv]
79. A. L. Greenaway, C. L. Melamed, M. B. Tellekamp, R. Woods-Robinson, E. S. Toberer, J. R. Neilson, A. C. Tamboli*, Ternary Nitride Materials: Fundamentals and Emerging Device Applications. *Ann. Rev. Mat. Res.* (2021), 51, 591-618. [doi][arXiv]
78. A. Wustrow, G. Huang, M. J. McDermott, D. O’Nolan, C.-H. Liu, G. T. Tran, B. C. McBride, S. S. Dwaraknath, K. W. Chapman, S. J. L. Billinge, K. A. Persson, K. Thornton, J. R. Neilson*, Lowering Ternary Oxide Synthesis Temperatures by Solid-State Cometathesis Reactions. *Chem. Mater.* (2021), 33(10), 3692-3701. (*ACS Editors’ Choice*) [doi]
77. C.-H. Liu, C. J. Wright, R. Gu, S. Bandi, A. Wustrow, P. K. Todd, D. O’Nolan, M. L. Beauvais, J. R. Neilson, P. J. Chupas, K. W. Chapman, S. J. L. Billinge*, Validation of non-negative matrix factorization for assessment of atomic pair-distribution function (PDF) data in a real-time streaming context. *J. Appl. Crystallogr.*, (2021), 54, 1-8. [arXiv] [doi]
76. J. R. Neilson*, Organic cation dynamics in hybrid halide perovskite semiconductors. *Neutron News*, (2021), 32(1), 11-12. (*Invited perspective*) [doi]
75. T. Yamamoto, I. W. H. Oswald, C. Savory, T. Ohmi, A. A. Koegel, D. O. Scanlon, H. Kageyama, J. R. Neilson*, Structure and optical properties of layered perovskite $(\text{MA})_2\text{PbI}_{2-x}\text{Br}_x(\text{SCN})_2$ ($0 \leq x < 1.6$). *Inorg. Chem.*, (2020), 59, 23, 17379-17384. [doi]



74. A. E. Maughan, E. M. Mozur, A. M. Candia, J. R. Neilson*, Ferroelastic Phase Transition in Formamidinium Tin(IV) Iodide Driven by Organic-Inorganic Coupling. *Inorg. Chem.* (2020), 59(19), 14399-14406. [doi]
73. P. K. Todd,[†] A. Wustrow,[†] R. D. McAuliffe,[†] M. J. McDermott,[†] G. T. Tran, B. C. McBride, E. D. Boeding, D. O’Nolan, C.-H. Liu, S. S. Dwaraknath, K. W. Chapman, S. J. L. Billinge, K. A. Persson, A. Huq, G. M. Veith, J. R. Neilson*, Defect-Accommodating Intermediates Yield Selective Low-Temperature Synthesis of YMnO₃ Polymorphs, (2020), 59(18), 13639-13650. [[†]: equal contributions]. [doi]
72. B. Xia, J. Cheng, M. Arengo, N. Rajput, Y. Janssen, J. R. Neilson, K. A. Persson, J. W. Simonson*, New trigonal polymorph of Li₂MnO₃. *Phys. Rev. Mat.*, (2020), 4, 085401. [doi]
71. P. K. Todd, A. J. Martinolich, J. R. Neilson*, Catalytic behavior of hexaphenyldisiloxane in the synthesis of pyrite FeS₂. *Chem. Commun.*, (2020), 56, 9186-9189. [doi]
70. E. M. Mozur, M. A. Hope, J. C. Trowbridge[‡], D. M. Halat, L. L. Daemen, T. R. Prisk, C. P. Grey, J. R. Neilson, Cesium Substitution Disrupts Concerted Cation Dynamics in Formamidinium Hybrid Perovskites. *Chem. Mater.* (2020), 32(14), 6266-6277. [doi]
69. C. L. Sarkis, M. J. Tarne, J. R. Neilson, H. B. Cao, E. Coldren, M. P. Gelfand, K. A. Ross*, Partial Antiferromagnetic Helical Order in Fe₃PO₄O₃, *Phys. Rev. B* (2020), 101, 184417. [arXiv][doi]
68. D. O’Nolan, G. Huang, G. E. Kamm, A. Grenier, C.-H. Liu, P. K. Todd, A. Wustrow, G. T. Tran, D. Montiel, J. R. Neilson, S. J. L. Billinge, P. J. Chupas, K. S. Thornton and K. W. Chapman*, A thermal gradient approach to variable temperature measurements resolved in space. *J. Appl. Crystallog.* (2020), 53(3) 1-9. [doi]
67. R. C. Miller, J. R. Neilson, A. L. Prieto*, Amide-Assisted Synthesis of Iron Germanium Sulfide (Fe₂GeS₄) Nanostars: The Effect of LiN(SiMe₃)₂ on Precursor Reactivity for Favoring Nanoparticle Nucleation or Growth. *J. Am. Chem. Soc.*, (2020), 142(15), 7023-7035. [doi]
66. C. Franco, A. Wustrow, B. Xia, A. M. Baccarella, F. Burgos, J. Nicasio, E. Dooryhee, J. R. Neilson, J. W. Simonson*, Optimized in situ crystal growth and disordered quasi-one dimensional magnetism in Li₂Mn₂(MoO₄)₃. *Phys. Rev. Mat.* (2020), 4(4) 045404. [doi]
65. R. C. Evans, Z. Nilsson, B. Balch, L. Wang, J. R. Neilson, C. R. Weinberger, J. B. Sambur*, Quantifying capacitive-like and battery-like charge storage contributions using single-nanoparticle electro-optical imaging. *ChemElectroChem*, (2020), 7, 753-760. [doi]
64. P. K. Todd, A. M. Smith[‡], J. R. Neilson*, Yttrium manganese oxide phase stability and selectivity using lithium carbonate assisted metathesis reactions. *Inorg. Chem.*, (2019), 58(22), 15166-15174. [doi]
63. M. J. Fallon, A. J. Martinolich, A. E. Maughan, L. C. Gallington, J. R. Neilson*, Low-Temperature Synthesis of Superconducting Iron Selenide Using a Triphenylphosphine Flux. *Dalton Trans.*, (2019), 48, 16298-16303. [doi]
62. I. W. H. Oswald, H. Ahn[‡], J. R. Neilson*, Influence of organic cation rigidity on structural templating in hybrid metal-halides. *Dalton Trans.*, (2019), 48, 16340-16349. [doi]

61. B. R. Ortiz, L. C. Gomes, J. R. Morey, M. Winiarski, M. B. Bordelon, J. S. Mangum, I. W. H. Oswald, J. A. Rodriguez-Rivera, J. R. Neilson, S. D. Wilson, E. Ertekin, T. M. McQueen, E. S. Toberer*, New kagome prototype materials: discovery of KV_3Sb_5 , RbV_3Sb_5 , and CsV_3Sb_5 , *Phys. Rev. Materials*, (2019), 3(9), 094407. [doi]
60. E. G. Rognerud[‡], C. L. Rom, P. K. Todd, N.R. Singstock, C. J. Bartel, A. M. Holder, J. R. Neilson*, Kinetically-controlled low-temperature solid-state metathesis of manganese nitride Mn_3N_2 . *Chem. Mater.*, (2019), 31, 19, 7248-7254. [doi]
59. E. M. Mozur, J. C. Trowbridge[‡], A. E. Maughan, M. J. Gorman[‡], C. M. Brown, T. R. Prisk, J. R. Neilson*, Dynamical Phase Transitions and Cation Orientation Dependent Photoconductivity in $CH(NH_2)_2PbBr_3$. *ACS Materials Lett.*, (2019), 1, 2, 260-264. [doi]
58. G. Hester, H. S. Nair, T. Reeder, D. R. Yahne, T. N. DeLazzer*, L. Berges, D. Ziat, J. A. Quilliam, J. R. Neilson, A. A. Aczel, G. Sala, K. A. Ross*, A Novel Strongly Spin-Orbit Coupled Quantum Dimer Magnet: $Yb_2Si_2O_7$. *Phys. Rev. Lett.*, 123, 027201. [arXiv][doi]
57. J. Hu, I. W. H. Oswald, H. Hu, S. J. Stuard, M. M. Nahid, L. Yan, Z. Chen, H. Ade, J. R. Neilson, W. You*, Aryl-Perfluoroaryl Interaction in Two-Dimensional Organic-Inorganic Hybrid Perovskites Boosts Stability and Photovoltaic Efficiency. *ACS Materials Lett.*, (2019) 1, 1,171-176. [doi]
56. V. E. Combs, I. W. H. Oswald, J. R. Neilson*, Hydrothermal Crystal Growth of Mixed Valence Cs_2SbBr_6 , *Cryst. Growth & Des.*, (2019), 19, 7, 4090-4094. [doi]
55. I. W. H. Oswald, I. P. Moseley, H. Ahn[‡], J. R. Neilson*, Hybrid charge-transfer semiconductors: $(C_7H_7)SbI_4$, $(C_7H_7)BiI_4$, and their halide congeners, *Inorg. Chem.*, (2019), 58(9), 5818-5826. [doi] [ChemRxiv]
54. J. Hu, I. W. H. Oswald, S. Stuard, M. M. Nahid, N. Zhou, O. Williams, Z. Guo, L. Yan, H. Hu, Z. Chen, X. Xiao, Y. Lin, Z. Yang, J. Huang, A. Moran, H. Ade, J. R. Neilson, W. You*, Synthetic Control over Orientational Degeneracy of Spacer Cations Enhances Solar Cell Efficiency in Two-Dimensional Perovskites. *Nat. Commun.*, (2019) 10, 1276. [doi]
53. A. E. Maughan, A. M. Ganose, D. O. Scanlon, J. R. Neilson*, Perspectives and Design Principles of Vacancy-Ordered Double Perovskite Halide Semiconductors, *Chem. Mater.*, (2019), 31(4), 1184-1195. [doi]
52. P. K. Todd, J. R. Neilson*, Selective Formation of Yttrium Manganese Oxides through Kinetically Competent Assisted Metathesis Reactions, *J. Am. Chem. Soc.* (2019), 141 (3), 1191–1195. [doi]
51. I. W. H. Oswald, A. A. Koegel, J. R. Neilson*. General Synthesis Principles for Ruddlesden-Popper Hybrid Perovskite Halides from a Dynamic Equilibrium. *Chem. Mater.* (2018), 30(23), 8606-8614. [doi]
50. A. E. Maughan, A. A. Paecklar, J. R. Neilson*, Bond valences and anharmonicity in vacancy-ordered double perovskite halides, *J. Mater. Chem. C.* (2018), 6, 12095-12104. [doi]
49. M. Mondal, D. Chaudhuri, M. Salehi, C. Wan, N. J. Laurita, B. Cheng, A. V. Stier, M. A. Quintero, J. Moon, D. Jain, P. P. Shibayev, J. R. Neilson, S. Oh, N. P. Armitage*, Electric field modulated topological magnetoelectric effect in Bi_2Se_3 , *Phys. Rev. B.* (2018) 98, 121106(R) [doi]






48. I. Bakst, K. J. Dusoe, G. Drachuck, J. R. Neilson, P. C. Canfield, S.-W. Lee, C. R. Weinberger, The effects of point defects on the mechanical response of LaRu₂P₂. *Acta Mater.* (2018) 160, 224-234. [doi]
47. I. Bhowmick, A. J. Roehl, J. R. Neilson, A. K. Rappé, M. P. Shores*, Slow magnetic relaxation in octahedral low-spin Ni(III) complexes, *Chem. Sci.* (2018) 9, 6564-6571. [doi]
46. A. E. Maughan, A. M. Ganose, M. A. Almaker[‡], D. O. Scanlon, and J. R. Neilson*, Tolerance Factor and Cooperative Tilting Effects in Vacancy-Ordered Double Perovskite Halides, *Chem. Mater.* (2018), 30(11), 3909-3919. [doi]
45. I. Bakst, J. T. Sypek, J. R. Neilson, S.-W. Lee, C. R. Weinberger*, Modeling pseudo-elastic behavior in small-scale ThCr₂Si₂-type crystals. *Comp. Mat. Sci.* (2018), 150, 86-95. [doi]
44. A. E. Maughan, A. M. Ganose, A. M. Candia[‡], J. T. Granger[‡], D. O. Scanlon, and J. R. Neilson*, Anharmonicity and Octahedral Tilting in Defect-Ordered Hybrid Perovskites. *Chem. Mater.* (2018), 30(2), 472-483. (ACS Editors' Choice; Issue cover graphic) [doi]
43. D. Olds, K. V. Lawler, A. A. Paecklar, J. Liu, K. L. Page*, P. F. Peterson, P. M. Forster, and J. R. Neilson, Capturing the details of N₂ adsorption in zeolite X using stroboscopic isotope contrasted neutron total scattering. *Chem. Mater.* (2018), 30(1), 296-302. [doi]
42. M. J. Tarne, M. M. Bordelon[‡], S. Calder, J. R. Neilson, K. A. Ross*, Tuning the antiferromagnetic helical pitch length and nanoscale domain size in Fe₃PO₄O₃ by magnetic dilution. *Phys. Rev. B* (2017) 96, 214431. [arXiv],[doi]
41. E. M. Mozur, A. E. Maughan, Y. Cheng, A. Huq, N. Jalarvo, L. L. Daemen, and J. R. Neilson*, Orientational Glass Formation in Substituted Hybrid Perovskites. *Chem. Mater.* (2017), 29(23), 10168-10177. [doi]
40. D. Olds, P. F. Peterson, M. K. Crawford, J. R. Neilson, H.-W. Wang, P. S. Whitfield, K. Page*, Combinatorial Appraisal of Transition States for in situ Pair Distribution Function Analysis. *J. Appl. Crystallogr.* (2017) 50, 1-10. [doi]
39. D. Olds, K. Page*, A. Paecklar, P. Peterson, J. Liu, G. Rucker, M. Ruiz-Rodriguez, M. Olsen, M. Pawel, S. Overbury, and J. R. Neilson, A high precision gas flow cell for performing in situ neutron studies of local atomic structure in catalytic materials. *Rev. Sci. Inst.* (2017) 88, 034101. [doi]
38. A. J. Martinolich, J. R. Neilson*, Towards Reaction-By-Design: Achieving Kinetic Control of Solid State Chemistry with Metathesis. *Chem. Mater.* (2017) 29(2), 479-489. (Invited perspective) [doi]
37. M. E. Marisa, S. Zhou, B. C. Melot, G. F. Peaslee, J. R. Neilson*, Paracrystalline Disorder from Phosphate Ion Orientation and Substitution in Synthetic Bone Mineral. *Inorg. Chem.* (2016) 55(23), 12290-12298. [doi]
36. A. J. Martinolich, J. A. Kurzman, J. R. Neilson*, Circumventing Diffusion in Kinetically-Controlled Solid-State Metathesis Reactions, *J. Am. Chem. Soc.* (2016), 138(34), 11031-11037. [doi]
35. A. E. Maughan, A. M. Ganose, M. M. Bordelon[‡], E. M. Miller, D. O. Scanlon, and J. R. Neilson*, Defect tolerance to intolerance in the vacancy-ordered double perovskite semiconductors Cs₂SnI₆ and Cs₂TeI₆. *J. Am. Chem. Soc.* (2016), 138(27), 8453-8464. [doi]



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33. J. A. Kurzman, A. J. Martinolich, and J. R. Neilson*. Influence of interstitial Mn on local structure and magnetism in $\text{Mn}_{1+\delta}\text{Sb}$. *Phys. Rev. B* (2015), 92, 184414. [arXiv],[doi]
32. K. A. Ross, M. M. Bordelon[†], G. S. Terho, J. R. Neilson*, Nanosized helical magnetic domains in strongly frustrated $\text{Fe}_3\text{PO}_4\text{O}_3$. *Phys. Rev. B*, (2015), 92, 134419. [arXiv],[doi]
31. J. R. Neilson, T. M. McQueen*, Representational Analysis of Extended Disorder in Atomistic Ensembles Derived from Total Scattering Data. *J. Appl. Crystallogr.*, (2015), 48, 1560–1572. [arXiv],[doi]
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