Curriculum Vitae
Jared M. Allred

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**Appointments** The University of Alabama, Department of Chemistry
 August 2015-present: Assistant Professor

Argonne National Laboratory, Materials Science Division
 August 2012-August 2015: Postdoctoral Appointee Supervisor: Stephan Rosenkranz

**Education**: Princeton University, June 2012
 PhD Chemistry
 Advisor: Robert J. Cava

Case Western Reserve University, May 2007
 B.S. Chemistry
 German (Minor)
 *Magna Cum laude*

**Awards:** Princeton Centennial Fellow (2007-2012)
Pickering Teaching Award (2009)
Dean’s High Honors (2003-2007)
Case Alumni Association Scholar (2005)
National Merit Scholar (2003)

**Funding Awards:**

 **Co-PI;** *MRI: Acquisition of a Single Crystal X-Ray Diffractometer for Structure Determination and Diffuse Scattering on Small Molecules, Macromolecules, and Materials*; National Science Foundation; Award Number 1828078; June 2018, **$339,587.00**

 **PI** *Investigation of Short-Range Ordering in Transition Metal Compounds by Diffuse Scattering;* Department of Energy, Early Career Program; Office of Basic Energy Sciences and DOE EPSCoR. Contract Number DE-SC0018174. September 2017; **$750,000/5 yr**

**Invited Oral Presentations at Conferences:**

North American Solid State Chemistry, July 2021
Rigaku Single Crystal Users Meeting, August 2020
American Chemical Society National Meeting & Expo, April 2019
SciMAN 2017, December 2017
Denver X-ray Conference, August 2016
American Conference on Neutron Scattering, July 2016
American Crystallographic Association Annual Meeting 2014
Oak Ridge National Lab SNS and HFIR User’s Group Meeting 2013

**Service:**

American Crystallographic Society, Powder Diffraction Special Interest Group
 Chair 2021
American Crystallographic Society Annual Meeting 2021:
 Chair/Organizer, Quantum Materials Session
American Crystallographic Society Annual Meeting 2020:
 Chair/Organizer, Quantum Materials Session (Cancelled due to COVID)
Science Review Committee, Sept 2016-present
 Oak Ridge National Laboratory, Neutron Sciences Directorate
 Reviewer, Powder Diffraction Subcommittee
American Crystallographic Society Annual Meeting 2015:
 Chair/Organizer, Emergent Phenomena Session

**Contributed Talks:**

 Materials Research Society, Fall Meeting, 2020
American Crystallographic Association, Annual Meeting 2019
Quantum Condensed Matter Young Investigators Meeting 2019
Quantum Condensed Matter Young Investigators Meeting 2017MINT Annual Review, 2018
American Crystallographic Association Annual Meeting, 2015American Conference on Neutron Scattering, 2014American Physical Society March Meeting 2014
American Physical Society March Meeting 2013

**Invited Seminars and Colloquia:**

University of Maryland, Quantum Materials Colloquium, February 2021
University of South Carolina, November 2020
Clemson University, November 2020
Georgia Southern University, October 2020
The College of New Jersey, September 2020
Brigham Young University, September 2019
Jackson State University, November 2018
The University of Alabama (Chemical Engineering), September 2018
Case Western Reserve University, April 2017
The University of Alabama, Birmingham, October 2016Southern Mississippi University Seminar, September 2016
Northern Illinois University Physics Colloquium; November, 2012
Argonne National Laboratory, Materials Science Division; April, 2012

**Teaching:**

General Chemistry I, CH101-002 Spring 2021
Hon. Gen. Chemistry I, CH117-001 Fall 2020X-ray Crystallography, CH605-001 Spring 2020
Hon. Gen. Chemistry I, CH117-001 Fall 2019General Chemistry II, CH102-002 Spring 2019General Chemistry I, CH101-001/-005 Fall 2018General Chemistry II, CH102-002 Spring 2018General Chemistry I, CH101-001 Fall 2017X-ray Crystallography, CH605-001 Spring 2017General Chemistry I, CH101-001 Fall 2016
General Chemistry I, CH101-002 Spring 2016

**Professional Society Membership**

American Chemical Society
American Physical Society
American Crystallographic Association
Neutron Scattering Society of America
Alpha Chi Sigma

**Publications:**

 **H-Index:** 17 **Times Cited:** 1369 in 1105 articles

1. Davenport, M. A., Krogstad, M. J.; Whitt, L. M.; Hu, C.; Douglas, T.C. Douglas; Ni, N.; Rosenkranz, S; Osborn, R.; Allred, J. M.; *Fragile 3D Order in V1-xMoxO2*. **Under Review**, Physical Review Letters; Pre-print arXiv:1909.12704
2. Sutch, T; Allred J. M.; Szulczewski, G. S.; *Electron conducting Ag2Te nanowire/polymer thermoelectric thin films*, J. Vac. Sci. Technol. A, **39**, 023401 , (2021) DOI: [DOI: 10.1116/6.0000690](https://doi.org/10.1116/6.0000690)
3. Xing, J., Cao. H, Paul, A., Hu, C.; Wang H.-H.; Luo, Y.; Chaklashiya, R.; Allred, J. M.; Brown, S.; Birol, T.; Ni, N.; *Anisotropic properties,* *charge ordering, and ferrimagnetic structure in the strongly correlated β-V2PO5 single crystal;* Physical Review Materials, **4,** 094414 (2020) DOI: 10.1103/PhysRevMaterials.4.094414
4. Davenport, Mathew A.; Allred, J.M.; *A crystallographic approach to the short-range ordering problem in V1-*x*Mo*x*O2 (0.50 ≤ x ≤ 0.60),* J. Mater. Chem. C, **8**, 10907-10916, (2020) **Emerging Investigators Issue** [DOI: 10.1039/D0TC01173H](https://doi.org/10.1039/D0TC01173H)
5. Davenport, Matthew A., Confer, Matthew P, Douglas, Tyra C, Rawot Chhetri, Top B., Allred, Jared M.; *Large single crystals of V1-xMoxO2 from a two-step, chemical vapor transport synthesis*. Cryst. Growth Des., 20, 6, 2625-2640 (2020) [DOI: 10.1021/acs.cgd.9b01296](https://doi.org/10.1021/acs.cgd.9b01296)
6. Ranjit, Smitri; Law, Ka Ming; Budhathoki, Sujan; Allred, Jared M.; Rosenberg, Richard; Park, Dong-Soo; Johnson, Scooter; Hauser, Adam; *Substrate damage and incorporation of sapphire into barium hexaferrite films deposited by aerosol deposition*, *J Am Ceram Soc*. 2020; 103: 1542– 1548 (2019)
7. Mbarushimana, C.; Liang, Q.; Allred, J. M.; Rupar, P.A. *Polymerizations of Nitrophenyl Sulfonyl-Activated Aziridines*, Macromolecules, **51**, 977-983 (2018). [DOI: 10.1021/acs.macromol.7b02125](https://pubs.acs.org/doi/abs/10.1021/acs.macromol.7b02125)
8. Taddei, K; Allred, J. M.; Bugaris, D; Lapidus, S; Krogstad, M; Claus, H, et al, *Observation of the magnetic C4 phase in Ca1−*x*Na*x*Fe2As2 and its universality in the hole-doped 122 superconductors*, Phys. Rev. B, **95,** 2017, 065408
9. Taddei, K.; Allred, J. M.; Bugaris, D; Lapidus, Saul; Krogstad, Matthew; Stadel, Ryan; Chung, Duck Young; Kanatzidis, Mercouri G.; Rosenkraz, Stephan; Osborn, Ray; Chmaissem, Omar*, Detailed magnetic and structural analysis mapping a robust magnetic C4 dome in in Sr1−*x*Na*x*Fe2As2*, Phys. Rev. B, **93**, 2016,134510
10. J. M. Allred, K. M. Taddei, D. E. Bugaris, M. J. Krogstad, S. H. Lapidus, D. Y. Chung, H. Claus, M. G. Kanatzidis, D. E. Brown, J. Kang, R. M. Fernandes, I. Eremin, S. Rosenkranz, O. Chmaissem, and R. Osborn, *Double-****Q*** *spin density wave in iron arsenide superconductors,* Nature Physics, 12, 493-498 (2016), DOI: 10.1038/NPHYS3629
11. J. M. Allred, S. Avci, D. Y. Chung, H. Claus, D. D. Khalyavin, P. Manuel, K. M. Taddei, M. G. Kanatzidis, S. Rosenkranz, R. Osborn, and O. Chmaissem*, Tetragonal magnetic phase in Ba1−*x*K*x*Fe2As2 from x-ray and neutron diffraction*, Phys. Rev. B, **92** (2015) 094515
12. M. Sturza, J. M. Allred, C. D. Malliakas, D. E. Bugaris, F. Han, D. Y. Chung and M. G. Kanatzidis, *Tuning the Magnetic Properties of New Layered Iron Chalcogenides (BaF)2Fe2-*xQ*3 (*Q*=S, Se) by Changing the Defect Concentration on the Iron Sublattice* Chem. Mater. (2015), *27* (9), pp 3280-3290
13. J. Zhang, H. Zheng, C. D. Malliakas, J. M. Allred, Y. Ren, Q. Li, T.-H. Han, and J. F. Mitchell, *Brownmillerite Ca2Co2O5: Synthesis, Stability, and Re-entrant Single Crystal Structural Transitions,* Chem. Mater., (2014) *26* (24) pp 7172-7182
14. J. M. Allred, K. M. Taddei, D. E. Bugaris, S. Avci, O. Chmaissem, D. Brown, D.Y. Chung, H. Klaus, A. Huq, M. G. Kanatzidis, O. Chmaissem, S. Rosenkranz, R. Osborn, *First order, coincident structural and magnetic phase transitions in BaFe2(As1-*x*P*x*)2 revealed by high-resolution neutron diffraction,* Phys. Rev. B **90**, (2014) 104513
15. D. D. Khalyavin, S. W. Lovesey, P. Manuel, F. Kruger, S. Rosenkranz, J. M. Allred, O. Chmaissem, R. Osborn, *Symmetry of re-entrant tetragonal phase in Ba1-xNaxFe2As2: Magnetic versus orbital ordering mechanism*, Phys. Rev. B, **90,** (2014) 174511
16. S. Avci, O. Chmaissem, J.M. Allred, S. Rosenkranz, I. Eremin, A. V. Chubukov, D. E. Bugaris, D.Y. Chung, M.G. Kanatzidis, J.-P. Castellan, J.A. Schlueter, H. Claus, D.D. Khalyavin, P. Manuel, A. Daoud-Aladine, R. Osborn, *Magnetically driven suppression of nematic order in an iron based superconductor.* Nat. Commun., **5:3845** (2014) doi: 10.1038/ncomms4845
17. S. Avci, J.M. Allred, O. Chmaissem, D.Y. Chung, S. Rosenkranz, J.A. Schlueter, H. Claus, A. Daoud-Aladine, D.D. Khalyavin, P. Manuel, A. Llobet, M.R. Suchomel, M.G. Kanatzidis, R. Osborn, *Structural, magnetic, and superconducting properties of Ba1-*x*Na*x*Fe2As2*, Phys. Rev. B, **88** (2013) 094510
18. D. Hirai, M. Bremholm, J.M. Allred, J. Krizan, L.M. Schoop, Q. Huang, J. Tao, R.J. Cava, *Spontaneous Formation of Zigzag Chains at the Metal-Insulator Transition in the beta-Pyrochlore CsW2O6*, Phys. Rev. Lett., **110** (2013) 166402
19. L.M. Schoop, J.M. Allred, N. Ni, D. Hirai, J. Krez, M. Schwall, HW Ji, M. N. Ali, R. J. Cava, *β-HfCuGe—A new polymorph of HfCuGe with a novel structure type,* J. Sol. St. Chem., **199**, (2013) 66-70
20. J.M. Allred and R.J. Cava, *Crystal Structures of the high temperature forms of V8O15 and V9O17 and Structural Trends in the VnO2n-1 Magnéli Series,* J. Sol. St. Chem, **198 (**2013) 10-17
21. J.M. Allred, Shuang Jia, M. Bremholm, B.C. Chan, and R.J. Cava, *Ordered CoSn-type ternary phases in Co3Sn3-*x*Ge*x, J. Alloys Comp., **539** (2012) 137-143
22. M. Neupane, S.-Y. Xu, L.A. Wray, A. Petersen, R. Shankar, N. Alidoust, C. Liu, A. Fedorov, H. Ji, J.M. Allred, Y.S. Hor, T.-R. Chang, H.-T. Jeng, H. Lin, A. Bansil, R.J. Cava, M.Z. Hasan, *Topological surface states and Dirac point tuning in ternary topological insulators,* Phys. Rev. B, **85** (2012)235406
23. HW. Ji, J.M. Allred, M. Fuccillo, M.E. Charles, M. Neupane, M.Z Hasan, and R.J Cava, *Bi2Te1.6S1.4 – A Topological Insulator with an exposed Dirac Point in the Tetradymite Family,* Phys. Rev. B*,* **85** (2012) 201103
24. HW. Ji, J.M. Allred, N. Ni, J. Tao, M. Neupane, L. Wray, S. Xu, M.Z. Hasan, and R.J. Cava, *Bulk Intergrowth of a Topological Insulator with a Room Temperature Ferromagnet,* Phys. Rev. B*.* **85**(2012) 165313
25. M. Neupane, Chang Liu, S.-Y. Xu, Y. J. Wang, N. Ni, J. M. Allred, L.A. Wray, H. Lin, R.S. Markiewicz, A. Bansil, R.J. Cava, and M.Z. Hasan, *Fermi surface topology and low-lying electronic structure of a new iron-based superconductor Ca10(Pt3As8)(Fe2As2)5*, Phys. Rev. B **85**(2012)094510
26. E. Mun, N. Ni, J. M. Allred, R. J. Cava, O. Ayala, R. D. McDonald, N. Harrison, and V. S. Zapf, *Anisotropic Hc2 determined up to 92 T and the signature of multi-band superconductivity in Ca10(Pt4As8)((Fe1-xPtx)2As2)5 superconductor,* Phys. Rev. B Rapid Comm., **85** (2012) 100502(R)
27. N. Ni, J. M. Allred, B. C. Chan, and R. J. Cava *High Tc Electron Doped Ca10(Pt3As8)(Fe2As2)5 and Ca10(Pt4As8)(Fe2As2)5Superconductors with Skutterudite Intermediary Layers,* Proc. Natl. Acad. Sci.*,* **108** (2011)E1021
28. J.M. Allred, L.M. Wang, P. Khalifah, and R.J. Cava,*Na27Ru14O48: A new mixed-valence sodium ruthenate with heptameric plaquettes,* J. Sol. St. Chem.*,* **184**(2011) 44-51
29. T.M. McQueen, Q. Huang, V. Ksenofontov, C. Felser, Q. Xu, H. Zandbergen, Y.S. Hor, J. Allred, A.J. Williams, D. Qu, J. Checkelsky, N.P. Ong, and R.J. Cava, *Extreme sensitivity of superconductivity to stoichiometry in Fe1+δSe,* Phys. Rev. B, **79** (2009) 014522