

Curriculum Vitae

Jared M. Allred

E-mail: jmallred@ua.edu

Phone: (205) 348-4653

Office: 3036 Shelby Hall

Mailing:

Box 870336

Tuscaloosa, AL 35401

Work 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)

Invited Talks and Lectures:

American Crystallographic Association Annual Meeting 2014
Oak Ridge National Lab SNS and HFIR User's Group Meeting 2013
Northern Illinois University Physics Colloquium; November, 2012
Argonne National Laboratory, Materials Science Division; April, 2012

Contributed Talks:

American Crystallographic Association Annual Meeting, 2015
American Conference on Neutron Scattering, 2014
American Physical Society March Meeting 2014
American Physical Society March Meeting 2013

Teaching: Head TA, Introductory Materials Chemistry, Princeton, Fall 2009
 TA, Introductory Materials Chemistry, Princeton, Fall 2008
 Supplemental Instructor, Organic Chemistry, CWRU, Summer 2006

Professional Society Membership

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

Service:

American Crystallographic Society Annual Meeting 2015:
Chair/Organizer, Emergent Phenomena Session

Publications:

- 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, (2016), DOI: 10.1038/NPHYS3629
- S. Jiang, C. Liu, H. Cao, T. Birol, J. M. Allred, W. Tian, L. Liu, K. Cho, M.J. Krogstad, J. Ma, K. M. Taddei, M. A. Tanatar, M. Hoesch, R. Prozorov, S. Rosenkranz, Y. J. Uemura, G. Kotliar, and N. Ni, *Structural and magnetic phase transitions in $\text{Ca}_{0.73}\text{La}_{0.27}\text{FeAs}_2$ with electron-overdoped FeAs layers*, Phys. Rev. B, **93** (2016) 054522
- 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 $\text{Ba}_{1-x}\text{K}_x\text{Fe}_2\text{As}_2$ from x-ray and neutron diffraction*, Phys. Rev. B, **92** (2015) 094515
- 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 $(\text{BaF})_2\text{Fe}_{2-x}\text{Q}_3$ (Q=S, Se) by Changing the Defect Concentration on the Iron Sublattice* Chem. Mater. (2015), 27 (9), pp 3280-3290
- J. Zhang, H. Zheng, C. D. Malliakas, J. M. Allred, Y. Ren, Q. Li, T.-H. Han, and J. F. Mitchell, *Brownmillerite $\text{Ca}_2\text{Co}_2\text{O}_5$: Synthesis, Stability, and Re-entrant Single Crystal Structural Transitions*, Chem. Mater., (2014) 26 (24) pp 7172-7182
- 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 $\text{BaFe}_2(\text{As}_{1-x}\text{P}_x)_2$ revealed by high-resolution neutron diffraction*, Phys. Rev. B **90**, (2014) 104513
- 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 $\text{Ba}_{1-x}\text{Na}_x\text{Fe}_2\text{As}_2$: Magnetic versus orbital ordering mechanism*, Phys. Rev. B, **90**, (2014) 174511
- 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. Castellán, 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
- 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 $\text{Ba}_{1-x}\text{Na}_x\text{Fe}_2\text{As}_2$* , Phys. Rev. B, **88** (2013) 094510

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

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

J.M. Allred and R.J. Cava, *Crystal Structures of the high temperature forms of V₈O₁₅ and V₉O₁₇ and Structural Trends in the V_nO_{2n-1} Magnéli Series*, J. Sol. St. Chem, **198** (2013) 10-17

J.M. Allred, Shuang Jia, M. Bremholm, B.C. Chan, and R.J. Cava, *Ordered CoSn-type ternary phases in Co₃Sn_{3-x}Ge_x*, J. Alloys Comp., **539** (2012) 137-143

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

HW. Ji, J.M. Allred, M. Fuccillo, M.E. Charles, M. Neupane, M.Z Hasan, and R.J Cava, *Bi₂Te_{1.6}S_{1.4} – A Topological Insulator with an exposed Dirac Point in the Tetradymite Family*, Phys. Rev. B, **85** (2012) 201103

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

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

E. Mun, N. Ni, J. M. Allred, R. J. Cava, O. Ayala, R. D. McDonald, N. Harrison, and V. S. Zapf, *Anisotropic H_{c2} determined up to 92 T and the signature of multi-band superconductivity in Ca₁₀(Pt₄As₈)(Fe_{1-x}Pt_x)₂As₂)₅ superconductor*, Phys. Rev. B Rapid Comm., **85** (2012) 100502(R)

N. Ni, J. M. Allred, B. C. Chan, and R. J. Cava *High T_c Electron Doped Ca₁₀(Pt₃As₈)(Fe₂As₂)₅ and Ca₁₀(Pt₄As₈)(Fe₂As₂)₅ Superconductors with Skutterudite Intermediary Layers*, Proc. Natl. Acad. Sci., **108** (2011) E1021

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

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 Fe_{1+δ}Se*, Phys. Rev. B, **79** (2009) 014522