CURRICULUM VITAE

Dr. Athena S. Sefat

Senior Scientist, Oak Ridge National Laboratory (ORNL)
Physical Sciences Directorate (PSD), Materials Science and Technology Division (MSTD),
Correlated Electron Materials Group (CEMG)

EDUCATION

McMaster University, Canada	BS, Chemistry	2001
McMaster University, Canada	PhD, Solid-state chemistry	2005

RESEARCH EXPERIENCE

Postdoc, Condensed-matter physics, Ames Laboratory (Physics Dept.)	2005 – 2007
Wigner Fellowship, ORNL	2007 – 2009
Laboratory Space Manager, ORNL (MSTD, CEMG)	2008 – 2013
DOE Early Career Award (ECA), ORNL	2010 – 2015

CURRENT POSITION: MAIN RESPONSIBILITIES, NOTABLE ACCOMPLISHMENTS

Principal Investigator (PI), ORNL 2015 – Present

- Lead a BES Materials Sciences and Engineering (MSE) Division project (~$1M/year budget), including planning and performing experiments, budgeting, staffing of researchers and postdocs, and reporting
- Total of >230 peer-reviewed publications, citations > 9000, h-index= 49 (Web of Science, January 2020)

BES Contractor, Office of Science, DOE Oct 2018 – Present

- Coordinate proposal handling and review for MSE Division, for the Experimental Condensed Matter Physics program

ONGOING ACTIVITIES AT PROFESSIONAL SOCIETIES

- Member of New Meetings Subcommittee (NMSC), at Materials Research Society (MRS): Committee reviews and decides on meeting initiatives, including workshops and sessions 2018 – Present
- Member of International Freedom of Scientists Committee, at American Physical Society (APS): Committee monitors concerns regarding human rights for scientists 2019 – Present

INTERNATIONAL/NATIONAL SCIENCE ACTIVITIES

2019 Member: Andrei Sakharov Prize Selection Committee at APS; Sakharov Prize recognizes outstanding leadership and achievements in upholding human rights

Chair: ORNL's Distinguished Staff Fellowship Committee, leading the committee in charge of hiring of new Russell, Wigner and Weinberg Fellows at the lab, including developing a charter, and leading efforts in selection process, evaluation, and integration plans for fellow

Panelist: ORNL's Postdoc Association Research Symposium judge for technical presentation competitions

Member: MRS' NMSC

Member: APS' Member of International Freedom of Scientists Committee

2018 Panelist: National Science Foundation (NSF), Division of Materials Research, onsite proposal review of Solid State and Materials Chemistry program

Panelist: ORNL's National GEM Consortium judge for technical presentation competitions

Panelist: ORNL's Women in PSD panelist for discussions on "Navigating your Career"

Panelist: Member of the Division of Materials Physics committee to review nominations and recommend candidates for election as APS Fellows

Delegate: ORNL's representative of APS professional organization, providing information on benefits and networking opportunities at the APS to postdocs and students

Chair: ORNL's Fellowship Committee

Member: MRS' NMSC

2017 Speaker: ORNL's Early Career Development Program speaker, for staff at Business Services Directorate

Panelist: DOE Office of BES, MSE Division, Brookhaven National Laboratory's (BNL's) onsite review of condensed-matter physics program

Panelist: Deutsche Forschungsgemeinschaft (DFG, German Research Foundation), offsite review for Clusters of Excellence proposals in the area of "Physics of Quantum Systems"

Panelist: ORNL's Fellowship Program Review Committee member, to evaluate ongoing fellowships

Panelist: ORNL's National GEM Consortium judge for technical presentation competitions

Chair: ORNL's Fellowship Committee

Advisory Committee: Universal Scientific Education and Research Network (USERN), provides a platform for international collaboration of scientists

2016 Panelist: Gordon Research Conference, Solid State Chemistry, on "Careers"

Organizer: International Conference on Superconductivity and Magnetism (ICSM), Turkey. Technical session on "Iron-based Superconductors: Properties of Materials in Single Crystal and Thin Film"

Chair: ORNL's Laboratory Directed Research and Development (LDRD) Committee chair, for Materials by Design Initiative

Chair: ORNL's Fellowship Committee

Advisory Committee: DOE Office of BES workshop "Basic Research Needs for Quantum Materials for Energy Relevant Technology" – Contributed to this report, and a figure (p. 88) https://science.osti.gov/-/media/bes/pdf/reports/2016/BRNQM_rpt_Final_12-09-2016.pdf?la=en&hash=E7760711641883FFC9F110D70385937D6A31C64F

Advisory Committee: USERN, provides a platform for international collaboration of scientists

Advisory Committee: ORNL's Member of Research Enterprise System (RESolution) Committee, which work alongside Office of Institutional Planning and an outside company to develop lab-wide project management tools and online applications for research staff

2015 Panelist: CRDF-QNRF Global Women in Science, organized by US Civilian Research and Development Foundation and Qatar National Science Foundation, Qatar. Speaker and panelist on the topics of women's education and jobs in science in Muslim countries

Panelist: NSF, Division of Materials Research, onsite proposal review of Solid State and Materials Chemistry program

Panelist: ORNL's LDRD Committee member, for Discovery and Innovation Initiative

Organizer: 20th American Conference on Crystal Growth and Epitaxy (ICCGE), symposium on "Correlated Electron Crystals"

Co-Organizer: MRS Conference, symposium on "Science and Technology of Superconducting Materials"

Advisory Committee: ORNL's Member of RESolution Committee

Advisory Committee: ORNL's member of Conflict of Interest Advisory Committee (COIAC), where committee works alongside Office of General Counsel and ORNL's Deputy Director for Science and Technology to review research staff proposals for outside activities

2014 Panelist: DOE Office of BES, MSE Division, BNL's onsite review of condensed-matter physics programs

Organizer: ICSM, Turkey. Technical session on "Iron-based Superconductors: Properties of Materials in Single Crystal and Thin Film"

Advisory Committee: ORNL's Member of RESolution Committee

Advisory Committee: ORNL's member of COIAC

2013 Organizer: 19th ACCGE, symposium on "Correlated Electron Crystals"

Co-Organizer: APS Conference, March Meeting, symposium on "Search for New Superconductors"

2012 Advisory Committee: Turkey's Collaborative Scientific Opportunities, organized by Ankara University with focus on international research opportunities in superconductivity and magnesium

2012 Co-Chair: Materials and Chemistry Seminar series, new initiative jointly sponsored by MSTD and Chemical Sciences Division within the PSD

2011 Co-Chair: Materials and Chemistry Seminar series

HONORS AND AWARDS

2019 Fellow, Institute of Physics (IOP), https://www.ornl.gov/news/ornls-sefat-named-institute-physics-fellow

Featured on the local-news network on "U.S. Secretary of Energy Rick Perry announces plan to build most powerful computer in the world at ORNL" https://www.wbir.com/video/tech/us-secretary-of-energy-rick-perry-announces-plan-to-build-most-powerful-computer-in-the-world-at-ornl/51-74983829-8f89-4bd6-a09b-c96d53425c09 and in *New Sentinel*, the local newspaper, on "Oak Ridge National Lab to get $95 million research building" https://www.knoxnews.com/story/money/business/2019/05/07/ornl-oak-ridge-national-laboratory-new-building/1120506001/

2017 University of Tennessee (UT) Bredesen Center faculty

Featured in *ORNL Review* on "Fundamentally strong: ORNL dives into basic science," vol. 50, no. 2 https://www.ornl.gov/sites/default/files/ORNL%20Review%20v50n2%202017.pdf#page=8

Featured on cover page of ORNL FY 2017 Annual Report

2016 Fellow, American Physical Society (APS), https://www.ornl.gov/news/six-ornl-researchers-elected-fellows-american-physical-society

ORNL "Significant Event Award," (SEA) for teamwork and science innovation

YWCA Tribute to Women, Finalist, in recognition of outstanding women in East Tennessee https://vimeo.com/183370036

2015 "40 Under 40": Featured in *Business Journal* as a Greater Knoxville region's rising star http://bit.ly/28LOUMf

ECA research was featured by Dr. Harriet Kung (DOE BES Director), at BES Advisory Committee (BESAC), July meeting

Featured by "Geek Puff," which records the advances of women in STEM fields http://www.geekpuff.com/crystals-design/

2014 "Thomson Reuters Highly Cited Researcher": In recognition of ranking among the top 1% of researchers being cited in the field of physics, between 2002 and 2013

Named as one of the "Five ORNL scientists rated among world's most influential" http://oakridgetoday.com/2014/08/01/five-ornl-scientists-rated-among-worlds-influential/

Chosen as an ORNL speaker for community outreach: "What problem are you working on?" https://www.youtube.com/watch?v=4VM6HLQ79XY

2013 DOE's "Women@Energy" https://www.energy.gov/articles/women-energy-athena-safa-sefat

Featured in *Professional Woman's Magazine* (2013, issue 13, page 58) on "Staying Close to Mother Nature", which describes my work in STEM fields

2011 ORNL's Gordon Battelle Award for Group Scientific Discovery

2010 ECA, DOE

ORNL Awards Night: Early Career Award for Scientific Accomplishment

Featured in an article in *Oak Ridger*, a local newspaper, on "Iranian finally allowed into U.S. nuke laboratory," for my persistence in remaining in science despite obstacles http://bit.ly/28Ne50s

2009 ORNL Awards Night: Director's Award for Outstanding Team Accomplishment

2007 ORNL (Eugene P.) Wigner Fellowship

2003 NSERC Doctoral Scholarship (Natural Science and Engineering Research Council of Canada), McMaster University

Ontario Graduate Scholarship, McMaster University

Shell Canada Scholarship in Science and Technology, McMaster University

2001 NSERC Undergraduate Research Award, McMaster University

2000 Canada Millennium Scholarship

PEER-REVIEWED JOURNAL PUBLICATIONS

Total = 233, Sum of Citations> 9000, h-index= 49 (Web of Science, January 2020)

Open Researcher and Contributor ID (ORCID): 0000-0002-5596-3504

*: Invited

(233) * A. S. Sefat, Highlights on High-T_c Conductor Tl(1223), Chapter in 2nd Edition of Handbook of Superconducting Materials, editors D. Cardwell and D. Larbalestier, CRC Press- Taylor & Francis Group (in press).

(232) L. D. Sanjeewa, A. S. Sefat, M. Smart, M. A. McGuire, C. D. McMillen, and J. W. Kolis, Synthesis, structure and magnetic properties of $Ba_3M_2Ge_4O_{14}$ (M = Mn and Fe): Quasi-one-dimensional zigzag chain compounds, *Journal of Solid State Chemistry* **283** (2020), 121090.

(231) L. D. Sanjeewa, V. O. Garlea, M. A. McGuire, J. Xing, H. Cao, J. W. Kolis, and A. S. Sefat, Observation of Large Magnetic Anisotropy and Field-induced Magnetic State in $SrCo(VO_4)(OH)$: A Structure with Quasi One-Dimensional Magnetic Chain, *Inorganic Chemistry* (2020), DOI: 10.1021/acs.inorgchem.9b02427.

(230) J. Xing, L. D. Sanjeewa, J. Kim, G. R. Stewart, M.-H. Du, F. A. Reboredo, R. Custelcean, and A. S. Sefat, Crystal synthesis and frustrated magnetism in triangular lattice Cs*RE*Se_2 (*RE*=La-Lu): Quantum spin liquid candidates $CsCeSe_2$ and $CsYbSe_2$, *ACS Materials Letters* **2**, 71 (2020).

(229) A. S. Sefat, X. P. Wang, Y. Liu, Q. Zou, M. M. Fu, Z. Gai, L. Li, G. Kalaiselvan, Y. Vohra, and D. S. Parker, Lattice disorder effect on magnetic ordering of iron arsenides, *Scientific Reports* **9**, 20147 (2019).

(228) K. M. Taddei, L D. Sanjeewa, B.-H. Lei, Y. Fu, Q. Zheng, D. J. Singh, A. S. Sefat, C. dela Cruz, Tuning from frustrated magnetism to superconductivity in quasi-one-dimensional KCr_3As_3 through hydrogen doping, *Physical Review B* **100**, 220503(R) (2019).

(227) J. Xing, L. D. Sanjeewa, J. Kim, G. R. Steward, A. A. Podlesnyak, and A. S. Sefat, Field-induced magnetic transition and spin fluctuation in the quantum spin-liquid candidate $CsYbSe_2$, *Physical Review B* **100**, 220407(R) (2019).

(226) J. Xing, L. D. Sanjeewa, J. Kim, W. R. Meier, A. F. May, Q. Zheng, R. Custelcean, G. R. Stewart, and A. S. Sefat, Synthesis, magnetization, and heat capacity of triangular lattice materials $NaErSe_2$ and $KErSe_2$, *Physical Review Materials* **3**, 114413 (2019).

(225) A. S. Sefat, G. D. Nguyen, D. S. Parker, M. M. Fu, Q. Zou, A. P. Li, H. B. Cao, L. D. Sanjeewa, L. Li, and Z. Gai, Local superconductivity in vanadium iron arsenide, *Physical Review B* **100,** 104525 (2019).

(224) Q. Zheng, M. Chi, M. Ziatdinov, L. Li, P. Maksymovych, M. F. Chisholm, S. V. Kalinin, and A. S. Sefat, Nanoscale interlayer defects in iron arsenides, *Journal of Solid State Chemistry* **277**, 422 (2019).

(223) A. Li, J.-X. Yin, J. Wang, Z. Wu, J. Ma, A. S. Sefat, B. C. Sales, D. G. Mandrus, M. A. McGuire, R. Jin, C. Zhang, P. Dai, B. Lv, C.-W. Chu, X. Liang, P.-H. Hor, C.-S. Ting, and S. H. Pan, Surface terminations and layer-resolved tunneling spectroscopy of the 122 iron pnictide superconductors, *Physical Review B* **99**, 134520 (2019).

(222) L. David, D. Mohanty, L. Geng, R. E. Ruther, A. S. Sefat, E. Cakmak, G. M. Veith, H. M. Meyer, H. Wang, and D. L. Wood, High-voltage performance of Ni-rich NCA cathodes: Linking operating voltage with cathode degradation, *ChemElectroChem* **6**, 5571 (2019).

(221) A. Mirmelstein, A. I. Kolesnikov, G. Ehlers, D. L. Abernathy, V. Matvienko, A. S. Sefat, and A. Podlesnyak, Dynamic Magnetic Response Across the Pressure-induced Structural Phase Transition in CeNi, *Physical Review B* **99**, 024401 (2019).

(220) K. M. Taddei, L. D. Sanjeewa, J. W. Kolis, A. S. Sefat, C. dela Cruz, and D. M. Pajerwski, Local-Ising-type magnetic order and metamagnetism in the rare-earth pyrogermanate $Er_2Ge_2O_7$, *Physical Review Materials* **3**, 014405 (2019).

(219) A. O. Ijaduola, R. Shipra, and A. S. Sefat, Effect of pressure on the superconducting properties of $Tl_2Ba_2Ca_2Cu_3O_{9-\delta}$, *Crystals* **9**, 4 (2019).

(218) J. S. Kim, D. VanGennep, J. J. Hamlin, X. Wang, A. S. Sefat, and G. R. Stewart, Unusual effects of Be doping in the iron-based superconductor FeSe, *Journal of Physics: Condensed Matter* **30**, 445701 (2018).

(217) S. E. Nikitin, L. S. Wu, A. S. Sefat, K. A. Shaykhutdinov, Z. Lu, S. Meng, E. V. Pomjakushina, K. Conder, G. Ehlers, M. D. Lumsden, A. I. Kolesnikov, S. Barilo, S. A. Guretskii, D. S. Inosov, and A. Podlesnyak, Decoupled spin dynamics in rare-earth orthoferrite $YbFeO_3$: Evolution of magnetic excitations through the spin-reorientation transition, *Physical Review B* **98**, 064424 (2018).

(216) J. B. Felder, M. D. Smith, A. Sefat, and H. C. zur Loye, Magnetic and thermal behavior of a family of compositionally related zero-dimensional fluorides, *Solid State Sciences* **81**, 19 (2018).

(215) K. M. Taddei, G. Xing, J. Sun, Y. Fu, Y. Li, Q. Zheng, A. S. Sefat, D. J. Singh, and C. dela Cruz, Frustrated structural instability in superconducting quasi-one-dimensional $K_2Cr_3As_3$, *Physical Review Letters* **121**, 187002 (2018).

(214) M. P. Smylie, H. Claus, W.-K. Kwok, E. R. Louden, M. R. Eskilden, A. S. Sefat, R. D. Zhong, J. Schneeloch, G. D. Gu, E. Bokari, P. M. Niraula, A. Kayani, C. D. Dewhurst, A. Snezhko, and U. Welp, Superconductivity, pairing symmetry, and disorder in the doped topological insulator $Sn1_xIn_xTe$ for $x \geq 0.10$, *Physical Review B* **97**, 024511 (2018).

(213) A. L. Dzubak, C. Mitra, M. Chance, S. Kuhn, G. E. Jellison, A. S. Sefat, J. T Krogel, and F. A. Reboredo, $MnNiO_3$ revisited with modern theoretical and experimental methods, *The Journal of Chemical Physics* **147**, 174703 (2017).

(212) S. Sundar, J. Mosqueira, A. D. Alvarenga, D. Sonora, A. S. Sefat, and S. Salem-Sugui, Study of the second magnetization peak and the pinning behavior in $Ba(Fe_{0.935}Co_{0.065})_2As_2$ pnictide superconductor, *Superconductor Science & Technology* **30**, 125007 (2017).

(211) K. M. Taddei, Q. Zheng, A. S. Sefat, and C. dela Cruz, Coupling of structure to magnetic and superconducting order in quasi-one-dimensional $K_2Cr_3As_3$, *Physical Review B* **96**, 180506 (2017).

(210) L. S. Wu, S. E. Nikitin, M. Frontzek, A. I. Kolesnikov, G. Ehlers, M. D. Lumsden, K. A. Shaykhutdinov, E.-J. Guo, A. T. Savici, Z. Gai, A. S. Sefat, and A. Podlesnyak, Magnetic ground state of the Ising-like antiferromagnet $DyScO_3$, *Physical Review B* **96**, 144407 (2017).

(209) S. Lafuerza, H. Gretarsson, F. Hardy, T. Wolf, C. Meingast, G. Giovannetti, M. Capone, A. S. Sefat, Y.-J. Kim, P. Glatzel, and L. Medici, Evidence of Mott physics in iron pnictides from x-ray spectroscopy, *Physical Review B* **96**, 045133 (2017).

(208) Q. Zou, Z. M. Wu, M. M. Fu, C. M. Zhang, S. Rajput, Y. P. Wu, L. Li, D. S. Parker, J. Kang, A. S. Sefat, and Z. Gai, Effect of surface morphology and magnetic impurities on the electronic structure in cobalt-doped $BaFe_2As_2$ superconductors, *Nano Letters* **17**, 1642 (2017).

(207) D. Mohanty, B. Mazumder, A. Devaraj, A. S. Sefat, A. Huq, L. A. David, E. A. Payzant, J. Li, D. L. Wood III, and C. Daniel, Resolving the degradation pathways in high-voltage oxides for high-energy-density lithium-ion batteries; Alteration in chemistry, composition and crystal structures, *Nano Energy* **36**, 76 (2017).

(206) L. Li, Q. Zheng, Q. Zou, S. Rajput, A. O. Ijaduola, Z. Wu, X. P. Wang, H. B. Cao, S. Somnath, S. Jesse, M. Chi, Z. Gai, D. Parker, and A. S. Sefat, Improving superconductivity in $BaFe_2As_2$-based crystals by cobalt clustering and electronic uniformity, *Scientific Reports* **7**, 949 (2017).

(205) P. Richard, A. van Roekeghem, B. Q. Lv, T. Qian, T. K. Kim, M. Hoesch, J.-P. Hu, A. S. Sefat, S. Biermann, and H. Ding, Is $BaCr_2As_2$ symmetrical to $BaFe_2As_2$ with respect to half 3d shell filling? *Physical Review B* **95**, 184516 (2017).

(204) L. M. N. Konzen and A. S. Sefat, Lattice parameters guide superconductivity in iron-arsenides, *Journal of Physics: Condensed Matter* **29**, 083001 (2017).

(203) S. Kuhn, M. Kidder, W. M. Chance, C. dela Cruz, M. A. McGuire, D. S. Parker, L. Li, L. M. Debeer-Schmitt, J. M. Ermentrout, K. Littrell, M. Eskildsen, and A. S. Sefat, Structure and property correlations in FeS, *Physica C: Superconductivity and its Applications* **534**, 29 (2017).

(202) S. J. Salem-Sugui, D. Moseley, S. J. Stuard, A. D. Alvarenga, A. S. Sefat, L. F. Cohen, and L. Ghivelder, Effects of proton irradiation on flux-pinning properties of underdoped $Ba(Fe_{0.96}Co_{0.04})_2As_2$ pnictide superconductor, *Journal of Alloys and Compounds* **694**, 1371 (2017).

(201) P. Vilmercati, S. K. Mo, A. Fedorov, M. McGuire, A. Sefat, B. Sales, D. Mandrus, D. J. Singh, W. Ku, S. Johnston, and N. Mannella, Nonrigid band shift and nonmonotonic electronic structure changes upon doping in the normal state of the pnictide high-temperature superconductor $Ba(Fe_{1-x}Co_x)_2As_2$, *Physical Review B* **94**, 195147 (2016).

(200) W. L. Zhang, A. S. Sefat, H. Ding, P. Richard, and G. Blumberg, Stress-induced nematicity in $EuFe_2As_2$ studied by Raman spectroscopy, *Physical Review B* **94**, 014513 (2016).

(199) M. A. Ziatdinov, A. B. Maksov, L. Li, A. S. Sefat, P. Maksymovych, and S. V. Kalinin, Deep data mining in real space: Separation of intertwinned electronic responses in a lightly-doped $BaFe_2As_2$, *Nanotechnology* **27**, 475706 (2016).

(198) X. Chen, L. Harriger, A. Sefat, R. J. Birgeneau, and S. D. Wilson, Strain-activated structural anisotropy in $BaFe_2As_2$, *Physical Review B* **93**, 144118 (2016).

(197) W. L. Zhang, P. Richard, A. Roekeghem, S. M. Nie, N. Xu, P. Zhang, H. Miao, S. F. Su, J. X. Yin, B. B. Fu, L. Y. Kong, T. Qian, Z. J. Wang, Z. Fang, A. S. Sefat, S. Biermann, and H. Ding, Angle-resolved photoemission observation of Mn-pnictide hybridization and negligible band structure renormalization in $BaMn_2As_2$ and $BaMn_2Sb_2$, *Physical Review B* **94**, 155155 (2016).

(196) L. Li, D. S. Parker, C. dela Cruz, and A. S. Sefat, Multi-layered chalcogenides with potential for magnetism and superconductivity, *Physica C: Superconductivity and Its Applications* **531**, 25 (2016).

(195) L. Li, H. Cao, D. S. Parker, S. J. Kuhn, and A. S. Sefat, Persistent magnetism in silver-doped $BaFe_2As_2$ crystals, *Physical Review B* **94**, 134510 (2016).

(194) A. Roekeghem, P. Richard, X. Shi, S. Wu, L. Zeng, B. Saparov, Y. Ohtsubo, T. Qian, A. S. Sefat, S. Biermann, and H. Ding, Tetragonal and collapsed-tetragonal phases of $CaFe_2As_2$– a view from angle-resolved photoemission and dynamical mean field theory, *Physical Review B* **93**, 245139 (2016).

(193) W. L. Zhang, Z. P. Yin, A. Ignatov, Z. Bukowski, J. Karpinski, A. S. Sefat, H. Ding, P. Richard, and G. Blumberg, Raman scattering study of spin-density-wave-induced anisotropic electronic properties in AFe_2As_2 (A=Ca, Eu), *Physical Review B* **93**, 205106 (2016).

(192) D. Mohanty, K. Dahlberg, D. M. King, L. A. David, A. S. Sefat, D. L. Wood, C. Daniel, S. Dhar, V. Mahajan, M. Lee, and F. Albano, Modification of Ni-rich FCG NMC and NCA cathodes by atomic layer deposition: Preventing surface phase transitions for high-voltage lithium-ion batteries, *Scientific Reports* **6**, 26532 (2016).

(191) Z. Q. Liu, L. Li, Z. Gai, J. D. Clarkson, S. L. Hsu, A. T. Wong, L. S. Fan, M.-W. Lin, C. M. Rouleau, T. Z. Ward, H. N. Lee, A. S. Sefat, H. M. Christen, and R. Ramesh, Full electroresistance modulation in a mixed-phase metallic alloy, *Physical Review Letters* **116**, 097203 (2016).

(190) A. Oleaga, V. Shvalya, A. S. Sefat, and A. Salazar, Transport thermal properties of $LiTaO_3$ pyroelectric sensor from 15 K to 400 K and its application to the study of critical behavior in $EuCo_2As_2$, *International Journal of Thermophysics* **37**, 4 (2016).

(189) A. S. Sefat, L. Li, H. B. Cao, M. A. McGuire, B. Sales, R. Custelcean, D. S. Parker, Anomalous magneto-elastic and charge doping effects in thallium-doped $BaFe_2As_2$, *Scientific Reports* **6**, 21660 (2016).

(188) L. Li, D. Parker, M. Chi, G. M. Tsoi, Y. K. Vohra, and A. S. Sefat, Metallicity of $Ca_2Cu_6P_5$ with single and double copper-pnictide layers, *Journal of Alloys and Compounds* **671**, 334 (2016).

(187) Z. Liu, M. D. Biegalski, S. L. Su, S. Shang, C. Marker, J. Liu, L. Li, L. Fan, T. L. Meyer, A. T. Wong, J. A. Nichols, D. Chen, L. You, Z. Chen, K. Wang, K. Wang, T. Z. Ward, Z. Gai, H. N. Lee, A. S. Sefat, V. Lauter, Z. K. Liu, and H. M. Christen, Epitaxial growth of intermetallic MnPt films on oxides and large exchange bias, *Advanced Materials* **28**, 118 (2016).

(186) R. Shipra and A. S. Sefat, Effect of Li_2O on the microstructure, magnetic and transport properties of Tl-2223 superconductor, *Physica C: Superconductivity and its applications* **519**, 108 (2015).

(185) L. Li, H. Cao, M. A. McGuire, J. S. Kim, G. R. Stewart, and A. S. Sefat, Role of magnetism in superconductivity of $BaFe_2As_2$: Study of 5*d* Au-doped crystals, *Physical Review B* **92**, 094504 (2015).

(184) A. Mirmelstein, A. Podlesnyak, A. M. dos Santos, G. Ehlers, O. Kerbel, V. Matvienko, A. S. Sefat, B. Saparov, G. J. Halder, and J. G. Tobin, Pressure-induced structural phase transition in CeNi: X-ray and neutron scattering studies and first-principles calculations, *Physical Review B* **92**, 054102 (2015).

(183) R. Shipra, J. C. Idrobo, and A. S. Sefat, Structural and superconducting features of Tl-1223 prepared at ambient pressure, *Superconductor Science & Technology* **28**, 115006 (2015).

(182) D. Moseley, K. A. Yates, W. R. Branford, A. S. Sefat, D. Mandrus, S. J. Stuart, S. Salem-Sugui, L. Ghivelder, and L. F. Cohen, Signatures of filamentary superconductivity in antiferromagnetic $BaFe_2As_2$ single crystals, *Europhysics Letters* **111**, 37005 (2015).

(181) R. Khasanov, Z. Guguchia, I. Eremin, H. Luetkens, A. Amato, P. K. Biswas, C. Ruegg, M. A. Susner, A. S. Sefat, N. D. Zhigadlo, and E. Morenzoni, Pressure-induced electronic phase separation of magnetism and superconductivity in CrAs, *Scientific Reports* **5**, 13788 (2015).

(180) S. F. Wu, P. Richard, A.v. Roekeghem, S. M. Nie, H. Miao, N. Xu, T. Qian, B. Saparov, Z. Fang, S. Biermann, A. S. Sefat, and H. Ding, Direct spectroscopic evidence for completely filled Cu 3*d* shell in $BaCu_2As_2$ and α-$BaCu_2Sb_2$, *Physical Review B* **91**, 235109 (2015).

(179) C. Cantoni, M. A. McGuire, B. Saparov, A. F. May, T. Keiber, F. Bridges, A. S. Sefat, and B. C. Sales, Room-temperature $Ba(Fe_{1-x}Co_x)_2As_2$ is not tetragonal: Direct observation of magnetoelastic interactions in pnictide superconductors, *Advanced Materials* **27**, 2715 (2015).

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ORNL MANAGEMENT COURSES

2017 1×1 coaching — DiSC style: **C**onscientiousness
2016 Workshop of Alan Alda Center for Communicating Science
2013 Vanderbilt Executive Management Development Program
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PATENT

B. M. Evans III, G. M. Ludtka, D. M. Nicholson, O. Rios, A. Safa-Sefat, D. L. West, "Iron-Based Composition for Magnetocaloric Effect (MCE) Applications and Method of Making a Single Crystal," 2016. U.S. Patent No. 9,255,343.

LEADING RESEARCH SUPPORT

PI DOE BES Project, MSE Division (ERKCK25): "Probing Competing Chemical, Electronic, & Spin Correlations for Quantum Materials Functionality" (2015 – present)

PI DOE's ECA (ERKCM70): "Origin of Superconductivity in Structurally Layered Materials" (2010 – 2015)

PI ORNL LDRD, SEED (6677): "Synthesis and Wire Development of Fe-Selenide Superconductors (FS)" (2012 – 2013)

PI ORNL LDRD (6741): "Exploration of Superconductivity in Non-Layered Three-Dimensional (3D) Materials" (2013 – 2014)

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