Bryan Charles Chakoumakos

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ACADEMIC RECORD

Ph.D. Geological Sciences Virginia Tech 1984
"Systematics of the pyrochlore structure type, and theoretical molecular modeling of silanol - water interactions."

M.S. Geological Sciences Virginia Tech 1981
"A molecular orbital study of I. rings in silicates and siloxanes and
II. order-disorder isomorphism in silicate anions."

B.S. Geology, *summa cum laude*, University of New Mexico 1978
with Departmental Honors
"Microlite, the Harding pegmatite, Taos County, New Mexico."

Scholastic	Cunningham Fellowship, Virginia Tech	1981-82
Awards:	State Tuition Scholarship, Virginia Tech	Fall 1980
	Albuquerque Gem & Mineral Club Scholarship, UNM	1975/1976
	Harry & Mabel Leonard Scholarship, UNM	1975/1976

PROFESSIONAL EXPERIENCE

Oak Ridge National Laboratory

Group Leader, *Single-Crystal Diffraction, NSD*	2020-present
Team Leader, *Single-Crystal Diffraction, Diffraction Group, NSD*	2018-2020
Instrument Scientist*, Diffraction Group, Neutron Scattering Division*	2017- 2018
Group Leader, *Structure of Matter, Quantum Condensed Matter Division*	2011-2017
Group Leader, *Single-Crystal Neutron Diffraction, NSD*	2006-2011
Instrument Scientist, *Neutron Scattering Sciences Division*	2006-2011
Instrument Scientist, *Center for Neutron Scattering, Solid State Division*	1993-2006
Staff Scientist, *Synthesis & Properties of Novel Materials Group, Solid State Division*	1988-1993

My active research program focuses on structure - property relationships in novel and technologically important materials. I have served as instrument scientist for the single-crystal four-circle diffractometer (2002-2011) and powder diffractometer (1994-2007) at the High Flux Isotope Reactor. Systematic crystal physics, chemistry and crystallography of inorganic materials are the broad themes of my research and collaborative contributions. Materials of interest include thermoelectric materials, gas hydrates, superconductors and related phases, intermetallics, phosphates, biomaterials (e.g., apatite, otoliths), silicates, metamict minerals, and granitic pegmatite. My "hands-on" experimental activities include X-ray (powder & single-crystal) and neutron (powder & single-crystal) diffraction, synthesis

of ceramic materials, growth of large single-crystals (flux, floating zone, and Czochralski methods), thermal analysis, optical microscopy, and analytical electron microscopy.

University of New Mexico, Department of Geology 1984-1988
Post-Doctoral Fellow: With Rodney C. Ewing, conducted experimental and theoretical investigations of the structural chemistry of α-decay damage in complex oxides. Departmental responsibilities included supervision and renovation of the x-ray diffraction and crystal synthesis laboratories, revision of the mineralogy curriculum, improvement of in-house computer hardware and software, and the design and instruction of a graduate level crystallography course.

Virginia Tech, Department of Geological Sciences 1978-1984
Graduate Teaching Assistant: Taught laboratory classes in Mineralogy (3 terms), Crystallography (2 terms), Optical Crystallography (3 terms), Igneous Petrography (1 term), and Introductory Geology (2 terms). Three summers and one year support as a Graduate Assistant were spent on maintenance, design, and installation of computer software for a research group of 7 (Investigator, G. V. Gibbs) doing quantum chemical and crystallographic calculations.

University of New Mexico Department of Geology 1974-1978
Curator of Mineralogy: Organized and maintained teaching and research collections, designed educational museum exhibits, and conducted library research for grant-supported projects (Investigator, R.C. Ewing) on crystal chemistry of radioactive waste forms. Also taught Mineralogy Laboratory (2 terms).

ACTIVE INTERESTS

Research: crystal structure-property relationships
magnetic crystal structures
synthesis and characterization of novel materials
crystal structure, physics, and chemistry of solids
metamictization and radiation damage of crystals and glasses
mineralogy and petrology of pegmatites and volatile-rich silicate melts

Teaching: crystallography, powder and single-crystal diffractometry, mineralogy, crystal chemistry, optical crystallography, materials physics

PROFESSIONAL AFFILIATIONS

American Association for the Advancement of Science (since 1983, Fellow 2016)
American Crystallographic Association (since 1983, Fellow 2016)
American Geophysical Union (since 1984)
American Physical Society (since 2007)
Mineralogical Association of Canada (since 1975)
Mineralogical Society of America (since 1973, Fellow 2007)
Neutron Scattering Society of America (since 1993, Fellow 2020)

HONORS & AWARDS

ORNL Corporate Fellow, elected 2020

Fellow, Neutron Scattering Society of America, elected 2020

Bau Neutron Diffraction Award, American Crystallographic Association, 2019

Fellow, American Association for the Advancement of Science, elected 2016, Geosciences Section

Fellow, American Crystallographic Association, elected 2016

Fellow, Mineralogical Society of America, elected 2007

PROFESSIONAL ACTIVITIES

Member of the U.S. National Committee for Crystallography, 2022-2024.

Member of the Research Committee for the Japan Atomic Energy Agency - U.S. Department of Energy Cooperative Program on Neutron Scattering, 1995- Present.

Chair, Nominating Committee, American Crystallographic Association, 2020.

Secretary, Mineralogical Society of America, 2015-2019.

Advisory Committee Member, National School on Neutron and X-ray Scattering, 2020 - present.

ORNL Science Director, National School on Neutron and X-ray Scattering, 2008-2018.

Letters Editor, *American Mineralogist*, 2005-2010.

Served as external reviewer for Sebastian Christensen's Ph.D. defense, Aarhus University, Aarhus, Denmark, Nov 2015.

Chair of the Powder Diffraction Special Interest Group of the American Crystallographic Association, 2005.

Expert for International Atomic Energy Agency educational mission to the Instituto Peruano Energía Nuclear, Lima, Peru, course instructor for Nuclear Techniques to Materials Applications, January 3-10, 2004.

Guest Editor, special issue on Clathrate Hydrates of the *American Mineralogist*, Vol 89, Aug-Sept 2004.

Executive Committee, Instrument Development Team for the Single Crystal Diffractometer, Spallation Neutron Source, Oak Ridge, Tennessee, June 2002-2011.

Session Organizer, “Clathrates, Ices and Planetary Materials” for the American Crystallographic Association Annual Meeting, Los Angeles, California, July 21-26, 2001.

Chair of the Neutron Scattering Special Interest Group of the American Crystallographic Association, 2001.

Associate Editor, *American Mineralogist*, 1999-2004.

Guest Editor, *Neutron News*, Volume 10, Issue 2, 1999, special issue on the neutron scattering facilities at the High Flux Isotope Reactor at Oak Ridge National Laboratory, 1998-1999.

Grand Awards Judge for Chemistry, International Science & Engineering Fair, Louisville, Kentucky, May 11-12, 1997.

Intense Pulsed Neutron Source Program Advisory Committee, 1996 – 2001.

Member of the Organizing Committee and Single-Crystal Diffraction Working Group Chair for the Workshop on Instrumentation Needs and Performance Metrics for the National Spallation Neutron Source, Oct. 31-Nov. 1, 1996, Oak Ridge, Tennessee, 1996.

Member of the Research Committee for the Institute for Solid State Physics (Univ. Tokyo) - U.S. Department of Energy Cooperative Program on Neutron Scattering, 1995 – 2005.

Correspondent for *Neutron News*, 1994 – 2004.

2nd Place in Optical Micrographs, The American Ceramic Society, Ceramographic Contest. "Dehydration of Newberyite" by L.A. Boatner, B.C. Sales, and B.C. Chakoumakos, 1992.

1st Place in the Unique/Unusual/New Techniques Class, International Metallographic Contest. "Ultramicroscopy of a Crystalline-To-Amorphous Phase Transition" by L.A. Boatner, B.C. Chakoumakos, B.C. Sales and A.G. Baldwin, 1992.

Technical Achievement Award, Martin Marietta Energy Systems, H.A. Mook, M. Mostoller, J.A. Harvey, N.W. Hill, B.C. Chakoumakos and B.C. Sales, Observation of phonon softening at the superconducting transition in $Bi_2Sr_2CaCu_2O_8$. *Physical Review Letters* 65, 2712-2715 (1990), 1992.

Participant, Rietveld Refinement Round-Robin sponsored by the Commission on Powder Diffraction of the International Union of Crystallography, 1991.

Young Scientist Award, International Union of Crystallography, Travel funds to attend the XIVth International Congress of Crystallography, Perth, Australia, 1987.

Photograph of microfracturing in zircon on cover of *Science* June 19, 1987, Volume 236, pp. 1493-1600.

Mentoring

Si “Athena” Chen, Ph.D. student, Department of Geosciences, PennState, summer 2021.

Matheus Pianassola, Ph.D. student, Materials Science and Engineering and Scintillation Materials Research Center, University of Tennessee, 2021-present; serving on Ph.D. Thesis committee.

Emil Klahn, Ph.D. student, Department of Chemistry, Aarhus University, Denmark for 4 months 2019

Daniel Rutstrom, undergraduate & Ph.D. student, Materials Science and Engineering and Scintillation Materials Research Center, University of Tennessee 2017-present.

R. Seth Wood, undergraduate, Department of Earth & Planetary Science, University of Tennessee, 2017-2018.

Jesse Johnson, undergraduate, Materials Science and Engineering and Scintillation Materials Research Center, University of Tennessee 2017.

Nikolaj Roth, Ph.D. student, Department of Chemistry, Aarhus University, Denmark for 2 months in 2016.

John Salasin, graduate, Materials Science and Engineering, University of Tennessee, 2014.

Marybeth Parker, Materials Science and Engineering, University of Tennessee, undergraduate, 2010-2011.

Huibo Cao, ORNL Post-doctoral Fellow, 2009-2010.

Lauren Garten, undergraduate, Missouri University of Science and Technology, summer intern 2008.

Birgitte Pedersen, Ph.D. student, Department of Chemistry, Aarhus University, Denmark for 5 months 2006.

Cara Nygren, Department of Chemistry, University of Tennessee, Knoxville, 2003-2005, served on Ph.D. Thesis committee.

Sam Subramaniam, Miles College, visiting faculty, Summer, 2002.

Matt Farmer, Baylor University, graduate student, chemistry, Summer, 1999.

M. Jenee Mitchell, Physics, Summer Intern, 1998.

Ben Coster, Southwestern Oklahoma State University, undergraduate, ORNL/Science and Energy Research Semester Program, Spring, 1995.

PUBLICATIONS
Web of Science: 262 pubs, 11507 citations, h-factor = 56
Google Scholar: 15852 citations, h-factor 67

Journal Articles

Chakoumakos, B.C., Xiaoping Wang, Antonio dos Santos, Magnetic structure of atacamite, $Cu_2(OH)_3Cl$, a distorted pyrochlore lattice. *Physical Review Materials*, in preparation.

Chen, S.A., **Bryan C. Chakoumakos**, James D. Kubicki, Yongqiang Chen, Luke L. Daemen, Jeffrey E. Post, Peter J. Heaney, Fingerprinting the water and vacancy sites in superhydrous hematite: Neutron scattering and first principles study. *American Mineralogist*, in preparation.

Sandemann, J.R., Thomas Bjørn Grønbech Egede, Kristoffer Andreas Holm Støckler, Feng Ye, **Bryan C. Chakoumakos**, Bo Brummerstedt Iversen, Direct visualization of magnetic interactions in frustrated spinel $ZnFe_2O_4$. *Proceedings of the National Academy of Sciences,* submitted.

Chakoumakos, B. C. and Pracheil, B. M., Optical petrography of vaterite in fish otoliths. *Canadian Mineralogist*, submitted.

Pianassola, M., Kaden L. Anderson, Joshua Safin, Can Agca, Jake W. McMurray, **Bryan C. Chakoumakos**, Jöerg C. Neuefeind, Charles L. Melcher, Mariya Zhuravleva, Phase stability and crystal growth of high-entropy rare-earth sesquioxides. *Chemistry of Materials,* submitted.

Wu, Y., Lei Ding, Na Su, Yinina Ma, Kun Zhai, Xiaojian Bai, **B. C. Chakoumakos**, Young Sun, Yongqiang Cheng, Jinguang Cheng, Wei Tian, Huibo Cao, Reentrance of spin-driven ferroelectricity through rotational tunneling of ammonium. *Nature Materials*, submitted.

Pianassola, M., Marlena Alexander, **Bryan C. Chakoumakos**, Merry Koschan, Charles L. Melcher, Mariya Zhuravleva, Effects of composition and growth parameters on phase formation in multicomponent aluminum garnet crystals. *Acta Crystallographica B* **78**, 476-484 (2022).

Wood, R.S., Allison M. Fortner, Kat Gillies-Rector, **B. C. Chakoumakos**, Matthias Frontzek, Ilia N. Ivanov, Linda C. Kah, Brian Kennedy, Brenda M. Pracheil, Quantifying fish otolith mineralogy for trace element chemistry studies. *Scientific Reports*, **12**, 2727 (2022).

Morgan, Z., Haidong Zhou, **Bryan Chakoumakos**, Feng Ye, RMC-DISCORD: Reverse Monte Carlo refinement of DIffuse Scattering and CORrelated Disorder from single crystals. *Journal of Applied Crystallography* **54**, 1867–1885 (2021).

Chakoumakos, B. C., J. B. Parise, Probing phase transitions and magnetism in minerals with neutrons. *Elements* **17**, 181-188 (2021).

Pianassola, M., Luis Stand, Madeline Loveday, **B. C. Chakoumakos**, Merry Koschan, Charles L. Melcher, Mariya Zhuravleva, Czochralski growth and characterization of the multicomponent garnet $(Lu_{1/4}Yb_{1/4}Y_{1/4}Gd_{1/4})_3Al_5O_{12}$. *Physical Review Materials* **5**, 083401 (2021).

Loeppky, A. R., Belding, L., Quijada-Rodriguez, A., Morgan, J., Pracheil, B., **Chakoumakos, B. C.**, Anderson, W.G., Otolith polymorph composition in sturgeons: Influence of ontogenetic development and environmental conditions. *Scientific Reports* **11**, 13878 (2021).

Liu, Y., Lin-Lin Wang, Qiang Zheng, Zengle Huang, Xiaoping Wang, Miaofang Chi, Yan Wu, **B. C. Chakoumakos**, Michael A. McGuire, Brian C. Sales, Weida Wu, Jiaqiang Yan, Site Mixing for Engineering Magnetic Topological Insulators. *Physical Review X* **11**, 021033 (2021).

Meier, W., **Chakoumakos, B.C.**, Okamoto, S., McGuire, M., Hermann, R., Samolyuk, G., Gao, S., Zhang, Q., Stone, M., Christianson, A., Sales, B., A catastrophic charge density wave in $BaFe_2Al_9$. *Chemistry of Materials* **33**, 8, 2855-2863 (2021).

Long, J. M., Richard A. Snow, Brenda M. Pracheil, **B. C. Chakoumakos**, Morphology and composition of Goldeye (Hiodontidae; *Hiodon alosoides*) otoliths. *Journal of Morphology* **282**, 511-519 (2021).

Liu, J.Y., J Yu, JL Ning, HM Yi, L Miao, LJ Min, YF Zhao, W Ning, KA Lopez, YL Zhu, T Pillsbury, YB Zhang, Y Wang, J Hu, HB Cao, **BC Chakoumakos**, F Balakirev, F Weickert, M Jaime, Y Lai, Kun Yang, JW Sun, N Alem, V Gopalan, CZ Chang, N Samarth, CX Liu, RD McDonald, ZQ Mao, Spin-valley locking and bulk quantum Hall effect in a noncentrosymmetric Dirac semimetal $BaMnSb_2$. *Nature Communications* **12**, 1-10 (2021).

Ding, L., Minseong Lee, Tao Hong, Zhiling Dun, Ryan Sinclair, Songxue Chi, Harish K. Agrawal, Eun Sang Choi, **B. C. Chakoumakos**, Haidong Zhou, H.B. Cao, Noncollinear magnetic structure and magnetoelectric coupling in buckled honeycomb $Co_4Nb_2O_9$: A single crystal neutron diffraction study. *Physical Review B* **102**, 174443 (2020).

Pianassola M., Loveday M., **Chakoumakos B.C.**, Koschan M., Melcher C.L., Zhuravleva M., Crystal growth and elemental homogeneity of the multicomponent rare-earth garnet $(Lu_{1/6}Y_{1/6}Ho_{1/6}Dy_{1/6}Tb_{1/6}Gd_{1/6})_3Al_5O_{12}$. *Crystal Growth and Design* **20**, 6769–6776 (2020).

Ding, L., Minseong Lee, Eun Sang Choi, Jing Zhang, Yan Wu, Ryan Sinclair, **Bryan C. Chakoumakos**, Yisheng Chai, Haidong Zhou, Huibo Cao, Large spin-driven dielectric response and magnetoelectric coupling in the buckled honeycomb $Fe_4Nb_2O_9$. *Physical Review Materials* **4**, 084403 (2020).

Dziaugys, A., Kyle Kelley, John Brehm, Alexander Puretzky, Tianli Feng, Sabine Neumayer, Marius Chyasnavichyus, Eugene Eliseev, Juras Banys, Yulian Vysochanskii, Feng Ye, **Bryan C. Chakoumakos**, Michael A. Susner, Michael McGuire, Sergei Kalinin, Panchapakesan Ganesh, Sokrates Pantelides, Nina Balke, Anna Morozovska, Petro Maksymovych, Piezoelectric domain walls in van der Waals ferrielectric $CuInP_2Se_6$. *Nature Communications* **11**, 3623 (2020).

Boatner, L. A., **B.C. Chakoumakos**, P. Sudharshan Phani, S. N. Dryepondt, Austen Shaw, Jun Qu, Andrés E. Márquez Rossy, Edgar Lara-Curzio, Michael McGuire, J. A. Kolopus, Cryo-quenched Fe-Ni-Cr alloy decorative steel single crystals II: Alloy phases, structure, hardness, tensile, tribological, magnetic and electronic properties. *Journal of Alloys and Compounds* **835**, 155169 (2020).

Galicki, D., **B. C. Chakoumakos**, S. P. Ringer, Mehdi Eizadjou, C. J. Rawn, Keita Nomoto, S. S. Babu, On the formation of spherical metastable BCC single crystal spatter particles during selective laser melting. *Materialia* **9**, 100584 (2020).

Liu, J., Pengfei Liu, Kyle Gordon, Eve Emmanouilidou, Jie Xing, David Graf, **B.C. Chakoumakos**, Yan Wu, Huibo Cao, Dan Dessau, Qihang Liu, Ni Ni, Nontrivial topology in the layered Dirac nodal-line semimetal candidate $SrZnSb_2$ with distorted Sb square nets. *Physical Review B* **100**, 195123 (2019).

Roth, N., Andrew F. May, Feng Ye, **B. C. Chakoumakos**, Bo Brummerstedt Iversen, Magnetic correlations and structure in bixbyite across the spin-glass transition. *Physical Review B* **100**, 1444404 (2019).

Pracheil, B. M., Robert George, **B. C. Chakoumakos**, Significance of otolith calcium carbonate crystal structure diversity to microchemistry studies. *Reviews in Fish Biology and Fisheries* **29**, 569-588 (2019).

Chakoumakos, B. C., Brenda M. Pracheil, R. Seth Wood, Alison Loeppky, Gary Anderson, Ryan Koenigs, Ronald Bruch, Texture analysis of polycrystalline vaterite spherulites from Lake Sturgeon otoliths. *Scientific Reports* **9**, 1–5 (2019).

Song, Y., Huibo Cao, **B. C. Chakoumakos**, Yang Zhao, Aifeng Wang, C. Petrovic, Robert J. Birgeneau, Intertwined magnetic and nematic orders in semiconducting $KFe_{0.8}Ag_{1.2}Te_2$. *Physical Review Letters* **122**, 087201 (2019).

Loeppky, A., **B. C. Chakoumakos**, B. M. Pracheil, G. Anderson, Otoliths of sub-adult Lake Sturgeon, *Acipenser fulvescens*, contain aragonite and vaterite calcium carbonate polymorphs. *Journal of Fish Biology* **94**, 810–814 (2019).

Xue, Z.L., Anibal J. Ramirez-Cuesta, Craig M. Brown, Huibo Cao, **B. C. Chakoumakos**, Luke L. Daemen, Ashfia Huq, A. I. Kolesnikov, Eugene Mamontov, A. A. Podlesnyak, Xiaoping Wang, Neutron instruments for research in coordination chemistry. *European Journal of Inorganic Chemistry* **2019** (8), 1065-1089 (2019).

Cao, H.B., **B. C. Chakoumakos**, Katie Andrews, Yan Wu, R. A. Riedel, Jason Hodges, Wenduo Zhou, Ray Gregory, Bianca Haberl, G. W. Lynn, DEMAND, a Dimensional Extreme Magnetic Neutron Diffractometer at the High Flux Isotope Reactor. *Crystals* **9**, 5 (2019).

Stand, L., Mariya Zhuravleva, **Bryan Chakoumakos**, Hua Wei, Jesse Johnson, Victoria Martin, Matthew Loyd, Daniel Rutstrom, Will McAlexander, Yuntao Wu, Merry A. Koschan, Charles Melcher, Characterization of mixed halide scintillators: $CsSrBrI_2$:Eu, $CsCaBrI_2$:Eu and $CsSrClBr_2$:Eu. *Journal of Luminescence* **207**, 70-77 (2019).

Frontzek, M., K. M. Andrews, A. B. Jones, **B. C. Chakoumakos**, J. A. Fernandez-Baca, The Wide Angle Neutron Diffractometer Squared ($WAND^2$) - Possibilities and Future. *Physica B* **551**, 464-467 (2018).

Peterson, C., M. W. Swift, Zach Porter, R. J. Clément, Guang Wu, G. H. Ahn, S. J. Moon, **B. C. Chakoumakos**, J. P. C. Ruff, Huibo Cao, C. Van de Walle, S. D. Wilson, $Sr_3Ir_2O_7F_2$: Topochemical conversion of a relativistic Mott state into a spin-orbit driven band insulator. *Physical Review B* **98**, 155128 (2018).

Frontzek, M. D., Whitfield, R., Andrews, K. M., Black, A. J., Bobrek, M., **Chakoumakos, B. C.**, Fernandez-Baca, J. A., $WAND^2$ - a versatile powder/single crystal diffractometer. *Review of Scientific Instruments* **89**, 092801 (2018).

Coates, L., Cao, H.B., **Chakoumakos, B.C.**, Frontzek, M. D., Hoffmann, C., Kovalevskyi, A. Y., Liu, Y., Meilleur, F., dos Santos, A.M., Myles, D.A.A., Wang, X., Ye, F., A Suite-level Review of the Neutron Single-Crystal Diffraction Instruments at Oak Ridge National Laboratory. *Review of Scientific Instruments* **89**, 092802 (2018).

Johnson II, J. A., Mariya Zhuravleva, Luis Stand, **B. C. Chakoumakos**, Yuntao Wu, Ian Greeley, Daniel Rutstrom, Merry Koschan, C. L. Melcher, Discovery of new compounds and scintillators of the A_4BX_6 family: Crystal structure, thermal, optical, and scintillation properties. *Crystal Growth and Design* **18**, 5220-5230 (2018).

Wu, Y., Ian Greeley, Matthew Loyd, Luis Stand, Charles Melcher, **Bryan Chakoumakos**, Merry A. Koschan, Daniel J. Rutstrom, Crystal structure, optical and scintillation properties of self-activated Cs_4YbI_6. *Journal of Luminescence* **201**, 460-465 (2018).

Roth, N., Andrew F. May, Feng Ye, **B. C. Chakoumakos**, Bo Brummerstedt Iversen, Model-free reconstruction of magnetic correlations in frustrated magnets. *IUCrJ* **5**, 410–416 (2018).

Wu, Y., Dan Han, **B. C. Chakoumakos**, Hongliang Shi, Shiyou Chen, Mao-Hua Du, Ian Greeley, Matthew Loyd, Daniel J. Rutstrom, Luis Stand, Mariya Zhuravleva, Merry Koschan, C. L. Melcher, Zero-dimensional Cs_4EuX_6 (X = Br, I) all-inorganic perovskite single crystals for gamma-ray spectroscopy. *Journal of Materials Chemistry C* **6**, 6647-6655 (2018).

Ye, F., Jinchen Wang, Jieming Sheng, C. Hoffmann, T. Gu, H. J. Xiang, Wei Tian, J. J. Molaison, A. M. dos Santos, M. Matsuda, **B. C. Chakoumakos**, J. A. Fernandez-Baca, X. Tong, Bin Gao, Jae Wook Kim, S.-W. Cheong, Soft antiphase tilt of oxygen octahedra in the hybrid improper multiferroic $Ca_3Mn_{1.9}Ti_{0.1}O_7$. *Physical Review B* **97**, 041112(R) (2018).

Stand, L., M. Zhuravleva, **B. Chakoumakos**, J. Johnson, M. Loyd, Y. Wu, M. Koschan, C.L. Melcher, Crystal growth and scintillation properties of Eu^{2+} doped Cs_4CaI_6 and Cs_4SrI_6. *Journal of Crystal Growth* **486**, 162-168 (2018).

Banerjee, A., P. Lampen-Kelley, J. Knolle, C. Balz, A.A. Aczel, B. Winn, Y. Liu, D. Pajerowski, J-Q. Yan, C.A. Bridges, A. Savicii, **B. C. Chakoumakos**, M. D. Lumsden, D.A. Tennant, R. Moessner, D.G. Mandrus, S.E. Nagler, Excitations in the field-induced quantum spin liquid state of α-$RuCl_3$. *npj Quantum Materials* **3**, 8 (2018).

Marquardt, D., Matthias D. Frontzek, Yu Zhao, **B. C. Chakoumakos**, John Katsaras, Neutron diffraction from aligned stacks of lipid bilayers using the WAND instrument. *Journal of Applied Crystallography* **51**, 235–241 (2018).

Zhai, K., Yan Wu, Shipeng Shen, Wei Tian, Huibo Cao, Yisheng Chai, **B. C. Chakoumakos**, Dashan Shang, Liqin Yan, Fangwei Wang, Young Sun, Giant magnetoelectric effects achieved by tuning spin cone symmetry in Y-type hexaferrites. *Nature Communications* **8**, 51 (2017).

Pracheil, B. M., **B. C. Chakoumakos**, Mikhail Feygenson, Gregory W. Whitledge, Ryan P. Koenings, Ronald M. Bruch, Sturgeon and paddlefish saggital otoliths are comprised of the calcium carbonate polymorphs vaterite and calcite. *Journal of Fish Biology* **90**, 549–558 (2017).

Cao, H.B., A. Banerjee, J.-Q. Yan, C. B. Bridges, M. L. Lumsden, D. G. Mandrus, **B. C. Chakoumakos**, S. E. Nagler, Low-temperature crystal and magnetic structure of α-$RuCl_3$. *Physical Review B* **93**, 134423 (2016).

Chakoumakos, B. C., B. M. Pracheil, R. P. Koenigs, R. M. Bruch, M. Feygenson, Empirically testing vaterite structural models using neutron diffraction and thermal analysis. *Scientific Reports* **6**, 36799 (2016).

Susner, M.A., B.S. Conner, B.I. Saparov, M.A. McGuire, E.J. Crumlin, G.M. Veith, H.B. Cao, K.V. Shanavas, D.S. Parker, **B.C. Chakoumakos**, B.C. Sales, Flux growth and characterization of Ce-substituted $Nd_2Fe_{14}B$ single crystals. *Journal of Magnetism and Magnetic Materials* **434**, 1-9 (2016).

Wu, Y., Q. K. Li, **B. C. Chakoumakos**, M. Zhuravleva, A. Lindsey, J. A. Johnson II, L. Stand, M. Koschan, C. L. Melcher, Quaternary Iodide $K(Ca,Sr)I_3:Eu^{2+}$ Single-crystal scintillators for radiation detection: Crystal structure, electronic structure, and optical and scintillation properties. *Advanced Optical Materials* **4**, 1518–1532 (2016).

Tian, W., H. B. Cao, J. C. Wang, F. Ye, M. Matsuda, J. Q. Yan, Y. Liu, V. O. Garlea, H. K. Agrawal, **B. C. Chakoumakos**, B. C. Sales, R. S. Fishman, J. A. Fernandez-Baca, Spin-lattice coupling mediated multiferroicity in $(ND_4)_2FeCl_5 \cdot D_2O$. *Physical Review B* **94**, 214405 (2016).

Stand, L., Zhuravleva, M., **B. C. Chakoumakos**, Jesse Johnson, Adam Lindsey, Charles L Melcher, Scintillation properties of Eu^{2+}-doped KBa_2I_5 and K_2BaI_4. *Journal of Luminescence* **169**, 301-307 (2016).

Ye, F., Xiaoping Wang, Christina Hoffmann, Jinchen Wang, Songxue Chi, Masaaki Matsuda, **B. C. Chakoumakos**, J. A. Fernandez-Baca, G. Cao, Structure symmetry determination and magnetic structure evolution in $Sr_2Ir_{1-x}Rh_xO_4$. *Physical Review B* **92**, 201112(R) (2015).

Wu, Y., Hongliang Shi, **B. C. Chakoumakos**, Mariya Zhuravleva, Mao-Hua Du, Charles L. Melcher, Crystal structure, electronic structure, temperature-dependent optical and scintillation properties of $CsCe_2Br_7$. *Journal of Materials Chemistry C* **3**, 11366-11376 (2015).

Farmer, J.M., L.A. Boatner, **B.C. Chakoumakos**, C.J. Rawn, Jim Richardson, Structural and crystal chemical properties of alkali rare-earth double phosphates. *Journal of Alloys and Compounds* **655**, 253-265 (2016).

Zhuravleva, M., Lindsey, A., **Chakoumakos, B.C.**, Custelcean, Meilleur, F., Hughes, R.W., Kriven, W.M., Melcher, C.L., Crystal structure and thermal expansion of a $CsCe_2Cl_7$ scintillator. *Journal of Solid State Chemistry* **227**, 142-149 (2015).

Ross, N.L., Jing Zhao, Carla Slebodnick, E.C. Spencer, **B.C. Chakoumakos**, Petalite under pressure: Structural response and revised elastic constants. *American Mineralogist* **100**, 714-721 (2015).

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