

COMPRES Publications (2017-2018) total=278

Publications: 12.2.2 at ALS (81)

1. Abramson, E.H., O. Bollengier, and J.M. Brown, "Water-carbon dioxide solid phase equilibria at pressures above 4 GPa," *Scientific Reports* 7(1), 821 (2017). (doi:10.1038/s41598-017-00915-0) 12.2.2
2. Adcock, C.T., O. Tschauner, E.M. Hausrath, A. Udry, S.N. Luo, Y. Cai, M. Ren, A. Lanzirotti, M. Newville, M. Kunz, and C. Lin, "Shock-transformation of whitlockite to merrillite and the implications for meteoritic phosphate," *Nature Communications* 8, 14667 (2017). (doi:10.1038/ncomms14667) 12.2.2
3. Bae, S., R. Taylor, D. Kilcoyne, J. Moon, and P. Monteiro, "Effects of Incorporating High-Volume Fly Ash into Tricalcium Silicate on the Degree of Silicate Polymerization and Aluminum Substitution for Silicon in Calcium Silicate Hydrate," *Materials* 10(2), 131 (2017). (doi:10.3390/ma10020131) 5.3.2.1, 5.3.2.2, 12.2.2
4. Borstad, G.M., and J.A. Ciezak-Jenkins, "Hydrogen-Bonding Modification in Biuret Under Pressure," *Journal of Physical Chemistry A* 121(4), 762-770 (2017). (doi:10.1021/acs.jpca.6b09670) 12.2.2
5. Cai, W., M. Dunuwille, J. He, T.V. Taylor, J.K. Hinton, M.C. MacLean, J.J. Molaison, A.M. Dos Santos, S. Sinogeikin, and S. Deemyad, "Deuterium Isotope Effects in Polymerization of Benzene under Pressure," *The Journal of Physical Chemistry Letters* 8(8), 1856-1864 (2017). (doi:10.1021/acs.jpcllett.7b00536) 12.2.2
6. Cai, W., R. Zhang, Y. Yao, and S. Deemyad, "Piezochromism and structural and electronic properties of benz[a]anthracene under pressure," *Phys. Chem. Chem. Phys.* 19(8), 6216-6223 (2017). (doi:10.1039/C6CP08171A) 12.2.2
7. Chen, Y., F. Ke, P. Ci, C. Ko, T. Park, S. Saremi, H. Liu, Y. Lee, J. Suh, L.W. Martin, J.W. Ager, B. Chen, and J. Wu, "Pressurizing Field-Effect Transistors of Few-Layer MoS₂ in a Diamond Anvil Cell," *Nano Letters* 17(1), 194-199 (2017). (doi:10.1021/acs.nanolett.6b03785) 12.2.2
8. Chen, Y., S. Zhang, F. Ke, C. Ko, S. Lee, K. Liu, B. Chen, J.W. Ager, R. Jeanloz, V. Eyert, and J. Wu, "Pressure-Temperature Phase Diagram of Vanadium Dioxide," *Nano Letters* 17(4), 2512-2516 (2017). (doi:10.1021/acs.nanolett.7b00233) 12.2.2
9. Ci, P., Y. Chen, J. Kang, R. Suzuki, H.S. Choe, J. Suh, C. Ko, T. Park, K. Shen, Y. Iwasa, S. Tongay, J.W. Ager, L.-W. Wang, and J. Wu, "Quantifying van der Waals Interactions in Layered Transition Metal Dichalcogenides from Pressure-Enhanced Valence Band Splitting," *Nano Letters* 17(8), 4982-4988 (2017). (doi:10.1021/acs.nanolett.7b02159) 12.2.2
10. Ciezak-Jenkins, J.A., and T.A. Jenkins, "Shear induced weakening of the hydrogen bonding lattice of the energetic material 5,5'-Hydrazinebistetrazole at high-pressure," *J. Mol. Struct.* 1129, 313-318 (2017). (doi:10.1016/j.molstruc.2016.09.084) 12.2.2
11. Ciezak-Jenkins, J.A., B.A. Steele, G.M. Borstad, and I.I. Oleynik, "Structural and spectroscopic studies of nitrogen-carbon monoxide mixtures: Photochemical response and observation of a novel phase," *The Journal of Chemical Physics* 146(18), 184309 (2017). (doi:10.1063/1.4983040) 12.2.2

12. Ciezak-Jenkins, J.A., G.M. Borstad, and I.G. Batyrev, "Characterization of the Isothermal Compression Behavior of LLM-172," *Journal of Physical Chemistry A* 121(22), 4263-4271 (2017). (doi:10.1021/acs.jpca.7b03300) 12.2.2
13. Doran, A., L. Schlicker, C.M. Beavers, S. Bhat, M.F. Bekheet, and A. Gurlo, "Compact low power infrared tube furnace for in situ X-ray powder diffraction," *Rev. Sci. Instrum.* 88(1), 013903 (2017). (doi:10.1063/1.4973561) 12.2.2
14. Vennari, C.E., E.F. O'Bannon, and Q. Williams, "The ammonium ion in a silicate under compression: infrared spectroscopy and powder X-ray diffraction of NH₄AlSi₃O₈-buddingtonite to 30 GPa," *Physics and Chemistry of Minerals* 44(2), 149-161 (2017). (doi:10.1007/s00269-016-0844-3) 12.2.2
15. Geng, G., R.J. Myers, J. Li, R. Maboudian, C. Carraro, D.A. Shapiro, and P.M. Monteiro, "Aluminum-induced dreierketten chain cross-links increase the mechanical properties of nanocrystalline calcium aluminosilicate hydrate," *Scientific Reports* 7, 44032 (2017). (doi:10.1038/srep44032) 5.3.2.1, 12.2.2
16. Geng, G., R.J. Myers, M.J. Qomi, and P. Monteiro, "Densification of the interlayer spacing governs the bynanomechanical properties of calcium-silicate-hydrate," *Scientific Reports* 7(1), 10986 (2017). (doi:10.1038/s41598-017-11146-8) 12.2.2
17. Gomis, O., B. Lavina, P. Rodríguez-Hernández, A. Muñoz, R. Errandonea, D. Errandonea, and M. Bettinelli, "High-pressure structural, elastic, and thermodynamic properties of zircon-type HoPO₄ and TmPO₄," *Journal of Physics: Condensed Matter* 29(9), 095401 (2017). (doi:10.1088/1361-648X/aa516a) 12.2.2
18. Groome, C., I. Roh, T.M. Mattox, and J.J. Urban, "Effects of Size and Structural Defects on the Vibrational Properties of Lanthanum Hexaboride Nanocrystals," *ACS Omega* 2(5), 2248-2254 (2017). (doi:10.1021/acsomega.7b00263) 12.2.2
19. Hong, F., B. Yue, Z. Liu, B. Chen, and H.-K. Mao, "Pressure-driven semiconductor-semiconductor transition and its structural origin in oxygen vacancy ordered SrCoO_{2.5}," *Physical Review B* 95(2), 024115 (2017). (doi:10.1103/PhysRevB.95.024115) 12.2.2
20. Jaffe, A., Y. Lin, W.L. Mao, and H.I. Karunadasa, "Pressure-Induced Metallization of the Halide Perovskite (CH₃NH₃)PbI₃," *Journal of the American Chemical Society* 139(12), 4330-4333 (2017). (doi:10.1021/jacs.7b01162) 12.2.2
21. Kapustin, E.A., S. Lee, A.S. Alshammari, and O.M. Yaghi, "Molecular Retrofitting Adapts a Metal-Organic Framework to Extreme Pressure," *ACS Cent Sci* 3(6), 662-667 (2017). (doi:10.1021/acscentsci.7b00169) 12.2.2
22. Köck, E.-M., M. Kogler, T. Götsch, L. Schlicker, M.F. Bekheet, A. Doran, A. Gurlo, B. Klötzer, B. Petermüller, D. Schildhammer, N. Yigit, and S. Penner, "Surface chemistry of pure tetragonal ZrO₂ and gas-phase dependence of the tetragonal-to-monoclinic ZrO₂ transformation," *Dalton Trans.* 46(14), 4554-4570 (2017). (doi:10.1039/C6DT04847A) 12.2.2
23. Köck, E.-M., M. Kogler, C. Zhuo, L. Schlicker, M.F. Bekheet, A. Doran, A. Gurlo, and S. Penner, "Surface Chemistry and Stability of Metastable Corundum-Type In₂O₃," *Phys. Chem. Chem. Phys.* 19(29), 19407-19419 (2017). (doi:10.1039/C7CP03632A) 12.2.2
24. Mattox, T.M., C. Groome, A. Doran, C.M. Beavers, and J.J. Urban, "Anion-mediated negative thermal expansion in lanthanum hexaboride," *Solid State Commun.* 265, 47-51 (2017). (doi:10.1016/j.ssc.2017.07.012) 12.2.2

25. Nisr, C., Y. Meng, A.A. MacDowell, J. Yan, V. Prakapenka, and S.-H. Shim, "Thermal expansion of SiC at high pressure-temperature and implications for thermal convection in the deep interiors of carbide exoplanets," *Journal of Geophysical Research: Planets* 122(1), 124-133 (2017). (doi:10.1002/2016JE005158) 12.2.2
26. O'Bannon, E.F., C.M. Beavers, M. Kunz, and Q. Williams, "The high-pressure phase of lawsonite: A single crystal study of a key mantle hydrous phase," 122(8), 6294-6305 (2017). (doi:10.1002/2017JB014344) 11.3.1, 12.2.2
27. Raju, S.V., R. Hrubciak, V. Drozd, and S. Saxena, "Laser-assisted processing of Ni-Al-Co-Ti under high pressure," *Mater. Manuf. Processes* 32(14), 1606-1611 (2017). (doi:10.1080/10426914.2016.1269913) 12.2.2
28. Rittman, D.R., S. Park, C.L. Tracy, L. Zhang, R.I. Palomares, M. Lang, A. Navrotsky, W.L. Mao, and R.C. Ewing, "Structure and bulk modulus of Ln-doped UO₂ (Ln = La, Nd) at high pressure," *Journal of Nuclear Materials* 490, 28-33 (2017). (doi:10.1016/j.jnucmat.2017.04.007) 12.2.2
29. Rittman, D.R., K.M. Turner, S. Park, A.F. Fuentes, J. Yan, R.C. Ewing, and W.L. Mao, "High-pressure behavior of A₂B₂O₇ pyrochlore (A=Eu, Dy; B=Ti, Zr)," *J. Appl. Phys.* 121(4), 045902 (2017). (doi:10.1063/1.4974871) 12.2.2
30. Rittman, D.R., K.M. Turner, S. Park, A.F. Fuentes, C. Park, R.C. Ewing, and W.L. Mao, "Strain engineered pyrochlore at high pressure," *Scientific Reports* 7(1), 2236 (2017). (doi:10.1038/s41598-017-02637-9) 12.2.2
31. Rodenbough, P.P., and S.-W. Chan, "Crystallite-size dependency of the pressure and temperature response in nanoparticles of magnesia," *Journal of Nanoparticle Research* 19(7), 241 (2017). (doi:10.1007/s11051-017-3922-7) 12.2.2
32. Ryu, Y.-J., C.-S. Yoo, M. Kim, X. Yong, J. Tse, S.K. Lee, and E.J. Kim, "Hydrogen-Doped Polymeric Carbon Monoxide at High Pressure," *Journal of Physical Chemistry C* 121(18), 10078-10088 (2017). (doi:10.1021/acs.jpcc.7b01506) 12.2.2
33. Santamaría-Pérez, D., T. Marqueño, S. MacLeod, J. Ruiz-Fuertes, D. Daisenberger, R. Chuliá-Jordan, D. Errandonea, J.L. Jordá, F. Rey, C. McGuire, A. Mahkluf, A. Kavner, and C. Popescu, "Structural Evolution of CO₂-Filled Pure Silica LTA Zeolite under High-Pressure High-Temperature Conditions," *Chem. Mater.* 29(10), 4502-4510 (2017). (doi:10.1021/acs.chemmater.7b01158) 12.2.2
34. Schlicker, L., M.F. Bekheet, and A. Gurlo, "Scaled-up solvothermal synthesis of nanosized metastable indium oxyhydroxide (InOOH) and corundum-type rhombohedral indium oxide (rh-In₂O₃)," *Z. Kristallogr.* 232(1-3), 129-140 (2017). (doi:10.1515/zkri-2016-1967) 12.2.2
35. Slavney, A.H., R.W. Smaha, I.C. Smith, A. Jaffe, D. Umeyama, and H.I. Karunadasa, "Chemical Approaches to Addressing the Instability and Toxicity of Lead-Halide Perovskite Absorbers," *Inorganic Chemistry* 56(1), 46-55 (2017). (doi:10.1021/acs.inorgchem.6b01336) 11.3.1, 12.2.2
36. Stavrou, E., J.M. Zaug, S. Bastea, and M. Kunz, "A study of tantalum pentoxide Ta₂O₅ structures up to 28 GPa," *J. Appl. Phys.* 121(17), 175901 (2017). (doi:10.1063/1.4982708) 12.2.2

37. Steele, B.A., E. Stavrou, J.C. Crowhurst, J.M. Zaug, V.B. Prakapenka, and I.I. Oleynik, "High-Pressure Synthesis of a Pentazolate Salt," *Chem. Mater.* 29(2), 735-741 (2017). (doi:10.1021/acs.chemmater.6b04538) 12.2.2
38. Turner, K.M., D.R. Rittman, R.A. Heymach, C.L. Tracy, M.L. Turner, A.F. Fuentes, W.L. Mao, and R.C. Ewing, "Pressure-induced structural modifications of rare-earth hafnate pyrochlore," *Journal of Physics: Condensed Matter* 29(25), 255401 (2017). (doi:10.1088/1361-648X/aa7148) 12.2.2
39. Wicks, J., J.M. Jackson, W. Sturhahn, and D. Zhang, "Sound velocity and density of magnesiowüstites: Implications for ultralow-velocity zone topography," *Geophys. Res. Lett.* 44(5), 2148-2158 (2017). (doi:10.1002/2016GL071225) 12.2.2
40. Zhang, F., Y. Wu, H. Lou, Z. Zeng, V.B. Prakapenka, E. Greenberg, Y. Ren, J. Yan, J.S. Okasinski, X. Liu, Y. Liu, Q. Zeng, and Z. Lu, "Polymorphism in a high-entropy alloy," *Nature Communications* 8, 15687 (2017). (doi:10.1038/ncomms15687) 12.2.2
41. Zhou, X., N. Tamura, Z. Mi, J. Lei, J. Yan, L. Zhang, W. Deng, F. Ke, B. Yue, and B. Chen, "Reversal in the Size Dependence of Grain Rotation," *Physical Review Letters* 118(9), 096101 (2017). (doi:10.1103/PhysRevLett.118.096101) 12.2.2, 12.3.2
42. Zhu, W., G. Moore, B. Aitken, S. Clark, and S. Sen, "Observation of Steady Shear-Induced Nematic Ordering of Selenium Chain Moieties in Arsenic Selenide Liquids," *Journal of Physical Chemistry B* 121(32), 7715-7722 (2017). (doi:10.1021/acs.jpcc.7b05115) 12.2.2
43. Bekheet, M.F., L. Schlicker, A. Doran, K. Siemensmeyer, and A. Gurlo, "Ferrimagnetism in manganese-rich gallium and aluminium spinels due to mixed valence Mn 2+–Mn 3+ states," *Dalton Transactions* 47(8), 2727-2738 (2018). (doi:10.1039/C7DT04765G) 12.2.2
44. Batyrev, I.G., S.P. Coleman, J. Ciezak-Jenkins, E. Stavrou, and J.M. Zaug, "Structure, Elastic Constants and XRD Spectra of Extended Solids under High Pressure," *MRS Advances* 3(8), 499-504 (2018). (doi:10.1557/adv.2018.277) 12.2.2
45. Bennion, J.C., I.G. Batyrev, and J.A. Ciezak-Jenkins, "The High-Pressure Characterization of Melt-Castable Energetic Materials: 3,3-Bis-Oxadiazole-5,5'-Bis-Methylene Dinitrate," *Propellants, Explosives, Pyrotechnics*, (2018). (doi:10.1002/prop.201800215) 12.2.2
46. Cheng, B., F. Zhang, H. Lou, X. Chen, P.K. Liaw, J. Yan, Z. Zeng, Y. Ding, and Q. Zeng, "Pressure-induced phase transition in the AlCoCrFeNi high-entropy alloy," *Scripta Materialia* 161, 88-92 (2019). (doi:10.1016/j.scriptamat.2018.10.020) 12.2.2
47. Chidester, B., O.S. Pardo, R.A. Fischer, E.C. Thompson, D.L. Heinz, C. Prescher, V. Prakapenka, and A.J. Campbell, "High-pressure phase behavior and equations of state of ThO₂ polymorphs," *American Mineralogist* 103(5), 749-756 (2018). (doi:10.2138/am-2018-6212) 12.2.2
48. Dai, Y., and Y. Qi, "High-Pressure-Induced Phase Transition in 2,5-Diketopiperazine: The Anisotropic Compression of N–H O Hydrogen-Bonded Tapes," *The Journal of Physical Chemistry C* 122(22), 11747-11753 (2018). (doi:10.1021/acs.jpcc.8b03931) 12.2.2
49. Dang, N. Chuong., and J. Ciezak-Jenkins, "Kinetic effects on the morphology and stability of the pressure-induced extended-solid of carbon monoxide," *The Journal of Chemical Physics* 148(14), 144702 (2018). (doi:10.1063/1.5004556) 12.2.2
50. Geng, G., J. Li, Y. Zhou, L. Liu, J. Yan, M. Kunz, and P.M. Monteiro, "A high-pressure X-ray diffraction study of the crystalline phases in calcium aluminate cement paste," *Cement and Concrete Research* 108, 38-45 (2018). (doi:10.1016/j.cemconres.2018.03.004) 12.2.2

51. Geng, G., R.N. Vasin, J. Li, M.J. Qomi, J. Yan, H.-R. Wenk, and P.M. Monteiro, "Preferred orientation of calcium aluminosilicate hydrate induced by confined compression," *Cement and Concrete Research* 113, 186-196 (2018). (doi:10.1016/j.cemconres.2018.09.002) 12.2.2
52. Gili, A., L. Schlicker, M.F. Bekheet, O. Görke, S. Penner, M. Grünbacher, T. Götsch, P. Littlewood, T.J. Marks, P.C. Stair, R. Schomäcker, A. Doran, S. Selve, U. Simon, and A. Gurlo, "Surface Carbon as a Reactive Intermediate in Dry Reforming of Methane to Syngas on a 5% Ni/MnO Catalyst," *ACS Catalysis* 8(9), 8739-8750 (2018). (doi:10.1021/acscatal.8b01820) 12.2.2
53. Götsch, T., K. Ploner, J. Bernardi, L. Schlicker, A. Gili, A. Doran, A. Gurlo, and S. Penner, "Formation of Pd-Ce intermetallic compounds by reductive metal-support interaction," *Journal of Solid State Chemistry* 265, 176-183 (2018). (doi:10.1016/j.jssc.2018.05.036)12.2.2
54. Götsch, T., L. Schlicker, M.F. Bekheet, A. Doran, M. Grünbacher, C. Praty, M. Tada, H. Matsui, N. Ishiguro, A. Gurlo, B. Klötzer, and S. Penner, "Structural investigations of La_{0.6}Sr_{0.4}FeO₃ under reducing conditions: kinetic and thermodynamic limitations for phase transformations and iron exsolution phenomena," *RSC Advances* 8(6), 3120-3131 (2018). (doi:10.1039/C7RA12309D) 12.2.2
55. Gu, K., R. Susilo, F. Ke, W. Deng, Y. Wang, L. Zhang, H. Xiao, and B. Chen, "Pressure-induced Enhancement in the Superconductivity of ZrTe₃," *Journal of Physics: Condensed Matter* 30(38), 385701 (2018). (doi:10.1088/1361-648X/aada53) 12.2.2
56. Guo, C., Y. Yang, L. Tan, J. Lei, S. Guo, B. Chen, J. Yan, and S. Yang, "Unexpected pressure induced ductileness tuning in sulfur doped polycrystalline nickel metal," *AIP Advances* 8(2), 025216 (2018). (doi:10.1063/1.5022267) 12.2.2
57. Kalkan, B., B.K. Godwal, S.V. Raju, and R. Jeanloz, "Local structure of molten AuGa₂ under pressure: Evidence for coordination change and planetary implications," *Scientific Reports* 8(1), 6844 (2018). (doi:10.1038/s41598-018-25297-9) 12.2.2
58. Köpfle, N., T. Götsch, M. Grünbacher, E.A. Carbonio, M. Hävecker, A. Knop-Gericke, L. Schlicker, A. Doran, D. Kober, A. Gurlo, S. Penner, and B. Klötzer, "Zirconium-assisted Activation of Palladium boosts Syngas Production by Methane Dry Reforming," *Angewandte Chemie International Edition* 57(44), 14613-14618 (2018). (doi:10.1002/anie.201807463)12.2.2
59. Kroonblawd, M.P., B. Koroglu, J.M. Zaug, P.F. Pagoria, N. Goldman, E. Greenberg, V.B. Prakapenka, M. Kunz, S. Bastea, and E. Stavrou, "Effects of pressure on the structure and lattice dynamics of ammonium perchlorate: A combined experimental and theoretical study," *The Journal of Chemical Physics* 149(3), 034501 (2018). (doi:10.1063/1.5030713) 12.2.2
60. Kunz, M., J. Yan, E.W. Cornell, E. Domning, C.E. Yen, A. Doran, C.M. Beavers, A.J. Treger, Q. Williams, and A.A. MacDowell, "Implementation and application of the peak scaling method for temperature measurement in the laser heated diamond anvil cell," *Review of Scientific Instruments* 89(8), 083903 (2018). (doi:10.1063/1.5028276) 12.2.2
61. Lei, J., M. Yeung, P.J. Robinson, R. Mohammadi, C.L. Turner, J. Yan, A. Kavner, A.N. Alexandrova, R.B. Kaner, and S. Tolbert, "Understanding How Bonding Controls Strength Anisotropy in Hard Materials by Comparing the High-Pressure Behavior of Orthorhombic and Tetragonal Tungsten Monoboride," *The Journal of Physical Chemistry C* 122(10), 5647-5656 (2018). (doi:10.1021/acs.jpcc.7b11478) 12.2.2

62. Ma, C., O. Tschauer, J.R. Beckett, G.R. Rossman, C. Prescher, V. Prakapenka, H.A. Bechtel, and A. MacDowell, "Liebermannite, KAlSi₃O₈, a new shock-metamorphic, high-pressure mineral from the Zagami Martian meteorite," *Meteoritics & Planetary Science* 53(1), 50-61 (2018). (doi:10.1111/maps.13000) 5.4, 12.2.2
63. Mansouri Tehrani, A., A.O. Oliyuk, M. Parry, Z. Rizvi, S. Couper, F. Lin, L. Miyagi, T.D. Sparks, and J. Brgoch, "Machine Learning Directed Search for Ultracompressible, Superhard Materials," *Journal of the American Chemical Society* 140(31), 9844-9853 (2018). (doi:10.1021/jacs.8b02717) 12.2.2
64. Mattox, T.Marie., C. Groome, A. Doran, C.M. Beavers, and J.J. Urban, "Chloride Influence on the Formation of Lanthanum Hexaboride: an In-Situ Diffraction Study," *Journal of Crystal Growth* 486, 60-65 (2018). (doi:10.1016/j.jcrysgro.2018.01.013) 12.2.2
65. Mi, Z., S.R. Shieh, A. Kavner, B. Kiefer, H. Wenk, and T.S. Duffy, "Strength and texture of sodium chloride to 56 GPa," *Journal of Applied Physics* 123(13), 135901 (2018). (doi:10.1063/1.5022273) 12.2.2,12.3.2
66. Morrison, R.A., J.M. Jackson, W. Sturhahn, D. Zhang, and E. Greenberg, "Equations of state and anisotropy of Fe-Ni-Si alloys," *Journal of Geophysical Research: Solid Earth* 123(6), 4647-4675 (2018). (doi:10.1029/2017JB015343) 12.2.2
67. O'Bannon, E., C.M. Beavers, M. Kunz, and Q. Williams, "High-pressure study of dravite tourmaline: Insights into the accommodating nature of the tourmaline structure," *American Mineralogist* 103(10), 1622-1633 (2018). (doi:10.2138/am-2018-6486) 12.2.2
68. Pople, D.C., E.A. Schriber, M. Yeung, and J.N. Hohman, "Competing Roles of Crystallization and Degradation of a Metal-Organic Chalcogenolate Assembly under Biphasic Solvothermal Conditions," *Langmuir*, acs.langmuir.8b03282 (2018). (doi:10.1021/acs.langmuir.8b03282) 12.2.2
69. Raju, S.V., B.K. Godwal, A.K. Singh, R. Jeanloz, and S.K. Saxena, "High-pressure strengths of Ni₃Al and Ni-Al-Cr," *Journal of Alloys and Compounds* 741, 642-647 (2018). (doi:10.1016/j.jallcom.2018.01.142) 12.2.2
70. Reagan, M.M., A.E. Gleason, J. Liu, M.J. Krawczynski, J.A. Van Orman, and W.L. Mao, "The effect of nickel on the strength of iron nickel alloys: Implications for the Earth's inner core," *Physics of the Earth and Planetary Interiors* 283, 43-47 (2018). (doi:10.1016/j.pepi.2018.08.003) 12.2.2
71. Schlicker, L., M.F. Bekheet, A. Gili, A. Doran, A. Gurlo, K. Ploner, T. Schachinger, and S. Penner, "Hydrogen reduction and metal-support interaction in a metastable metal-oxide system: Pd on rhombohedral In₂O₃," *Journal of Solid State Chemistry* 266, 93-99 (2018). (doi:10.1016/j.jssc.2018.07.010) 12.2.2
72. Schlicker, L., A. Doran, P. Schnepfmüller, A. Gili, M. Czásny, S. Penner, and A. Gurlo, "Transmission in situ and operando high temperature X-ray powder diffraction in variable gaseous environments," *Review of Scientific Instruments* 89(3), 033904 (2018). (doi:10.1063/1.5001695) 12.2.2
73. Solomatova, N.V., A. Alieva, G.J. Finkelstein, W. Sturhahn, M.B. Baker, C.M. Beavers, J. Zhao, T.S. Toellner, and J.M. Jackson, "High-pressure single-crystal X-ray diffraction and synchrotron Mössbauer study of monoclinic ferrosilite," *Comptes Rendus Geoscience*, (2018). (doi:10.1016/j.crte.2018.06.012) 12.2.2

74. Stan, C.V., C.M. Beavers, M. Kunz, and N. Tamura, "X-Ray Diffraction under Extreme Conditions at the Advanced Light Source," *Quantum Beam Science* 2(1), 4 (2018). (doi:10.3390/qubs2010004) 11.3.1,12.2.1,12.2.2,12.3.2
75. Stavrou, E., Y. Yao, A.F. Goncharov, S.S. Lobanov, J.M. Zaug, H. Liu, E. Greenberg, and V. Prakapenka, "Synthesis of Xenon and Iron-Nickel Intermetallic Compounds at Earth's Core Thermodynamic Conditions," *Physical Review Letters* 120(9), 096001 (2018). (doi:10.1103/PhysRevLett.120.096001) 12.2.2
76. Vennari, C.E., C.M. Beavers, and Q. Williams, "High-Pressure/Temperature Behavior of the Alkali/Calcium Carbonate Shortite ($\text{Na}_2\text{Ca}_2(\text{CO}_3)_3$): Implications for Carbon Sequestration in Earth's Transition Zone," *Journal of Geophysical Research: Solid Earth* 123(8), 6574-6591 (2018). (doi:10.1029/2018JB015846) 11.3.1,12.2.2
77. Yan, H., F. Yang, D. Pan, Y. Lin, J. Nathan. Hohman, D. Solis-Ibarra, F.H. Li, J.P. Dahl, R.K. Carlson, B.A. Tkachenko, A.A. Fokin, P.R. Schreiner, G. Galli, W.L. Mao, Z.-X. Shen, and N. Melosh, "Sterically controlled mechanochemistry under hydrostatic pressure," *Nature* 554(7693), 505-510 (2018). (doi:10.1038/nature25765) 11.3.1,12.2.2
78. Zhang, F., H. Lou, S. Chen, X. Chen, Z. Zeng, J. Yan, W. Zhao, Y. Wu, Z. Lu and Q. Zeng, "Effects of non-hydrostaticity and grain size on the pressure-induced phase transition of the CoCrFeMnNi high-entropy alloy, *Journal of Applied Physics* 124(11), 115901 (2018). (doi:10.1063/1.5046180) 12.2.2.

Ph. D. THESES

79. O'Bannon, E.F., "High-pressure studies of subduction zone related mineral phases," Doctoral Dissertation, University of California Santa Cruz, Santa Cruz, CA, 2017, advisor Quentin Williams. 12.2.2, 11.3.1, 1.4
80. Zepeda-Alarcon, E., "Texture Development and Polycrystal Plasticity of Two-Phase Aggregates," Doctoral Dissertation, University of California, Berkeley, Berkeley, California, USA, 2017, advisor Hans-Rudolf Wenk. 12.2.2
81. Zhou, X., "Study on the plastic deformation and elastic properties of nano metal," Doctoral Dissertation, Center for High Pressure Science and Technology Advanced Research (HPSTAR), Shanghai, China, 2017, advisor Bin Chen. 12.2.2, 12.3.2

Publications: IXS at Extreme Pressure and Temperature at 3-ID at APS (25)

1. Finkelstein, G. J., Jackson, J. M., Sturhahn W., Zhang, D., Alp, E. E., Toellner, T. S., Single-crystal equations of state of magnesiowüstite at high pressures, *Am. Mineral.* 102, 1709, 2017.
2. Solomatova, N. V., Jackson J. M., Sturhahn, W., Rossmann, G. R., and Roskosz, M., The electronic environment of ferrous iron in rhyolitic and basaltic glasses at high pressure, *Journal of Geophysical Research: Solid Earth*, in press., 2017.
3. Liu, J., Dauphas, N., Roskosz, M., Hu, M. Y., Yang, H., Bi, W., Zhao, J., Alp, E. E., Hu, J. Y., Lin, J-F., Iron isotopic fractionation between silicate mantle and metallic core at high pressure. *Nat. Commun.* 8, 14377, 2017.

4. Wicks, J. K., Jackson, J. M., Sturhahn, W., Zhang, D., Sound velocity and density of magnesiowüstites: Implications for ultralow-velocity zone topography, *Geophys. Res. Lett.* 44 (5), 2148, 2017.
5. Solomatova, N. V., Iron-bearing Oxides, Silicate Glasses and Carbonates at Lower Mantle Pressures, Ph.D.-Thesis, California Institute of Technology, 2017.
6. Shim, S.-H., Grocholski, B., Ye, Y., Alp, E. E., Xu, S., Morgan, D., Meng Y., and Prakapenka, V. B., Stability of ferrous-iron bridgmanite under reducing midmantle conditions, *PNAS*, 114, 6468, 2017.
7. Dauphas, N., John, S. G., Rouxel, O., Iron Isotope Systematics. Review in *Mineralogy & Geochemistry*, 82, 415-510, 2017.
8. Solomatova N.V., Alieva A., Finkselstein G.J., Sturhahn W., Baker M.B., Beavers C.M., Zhao J., Toellner T.S., and Jackson J.M., High-pressure single-crystal X-ray diffraction and synchrotron Mössbauer study of monoclinic ferrosilite, *Comptes Rendus Geoscience*, (in press) 2018.
9. Finkelstein G.J., Jackson J.M., Said A., Alatas A., and Leu B.M., Sturhahn W., and Toellner T.S., Strongly anisotropic magnesiowüstite in Earth's lower mantle, *J. Geophys. Res.*, 123, 4740-4750, 2018.
10. Prissel K.B., Krawczynski J.M., Nie N.X., Dauphas N., Couvy H., Hu M.Y., Alp E.E., Roskosz M., Experimentally determined effects of olivine crystallization and melt titanium content on iron isotope fractionation in planetary basalts, *Geochim. Cosmochim. Acta* 238, 580, 2018.
11. Chen B., Lai X., Li J., Liu, J., Zhao J., Bi W., Alp E. E., Hu M. Y. & Xiao Y., Experimental constraints on the sound velocities of cementite Fe₃C to core pressures, *Earth Planet. Sci. Lett.* 494, 164-171, 2018.
12. Klein R. A., Walsh J. P. S., Clarke S. M., Guo Y., Bi W., Fabbris G., Meng Y., Haskel D., Alp E. E., Duyn R. P. Van, Jacobsen S. D. & Freeman D. E., Impact of pressure on magnetic order in jarosite, *J. Am. Chem. Soc.* 140, 12001, 2018.
13. Materne P., Bi W., Alp E.E., Zhao J., Hu M. Y., Jesche A., Geibel C., Kappenberger R., Aswartham S., Wurmehl S., Büchner B., Zhang D., Goltz T., Spehling J. & Klauss H. *Phys. Rev. B.* 98, 14517, 2018.
14. Thompson E.C., Davis A. H., Bi W., Zhao J., Alp E. E., Zhang D., Greenberg E., Prakapenka V. B. & Campbell A. J., High-pressure geophysical properties of fcc phase FeHx, *Geochemistry, Geophys. Geosystems.* 19, 305-314, 2018.
15. Fei Y., Iqbal M., Kong S. D., Xue Z., McFadden C. P., Guillet J. L., Doerr L. H., Alp E. E., Bi W., Lu Y., Dandamudi C. B., Ranganath P. J., Javier K. J., Ahmadian M., Ellison C. J. & Johnston K. P., Aqueous Superparamagnetic magnetite dispersions with ultrahigh initial magnetic susceptibilities, *Langmuir.* 34, 622–629, 2018.
16. Liu J., Dorfman S. M., Zhu F., Li J., Wang Y., Zhang D., Xiao Y., Bi W. & Alp, E. E., Valence and spin states of iron are invisible in Earth's lower mantle, *Nat. Commun.* 9,1284, 2018.
17. Y. Hong, Lin J-F., Hu M.Y., Roskosz M., Bi W., Zhao J., Alp E.E., Liu J., Liu J., Wentzowitch R.M., Okuchi T., Dauphas N., Iron isotopic fractionation in mineral phases from earth's lower mantle: did terrestrial magma ocean crystallization fractionate iron isotopes? *Earth Planet. Sci. Lett.* (in press) 2018.
18. Materne P., Bi W., Alp E.E., Zhao J., Hu M. Y., Jesche A., Geibel C., Kappenberger R., Aswartham S., Wurmehl S., Büchner B., Zhang D., Goltz T., Spehling J. & Klauss H.,

Bandwidth controlled insulator-metal transition in BaFe₂S₃: a Mössbauer study under pressure, *Phys. Rev. B* (under review) 2018.

19. Materne P., Bi W., Zhao J., Hu M.Y., Alp E. E., Kappenberger R., Aswartham S., Wurmehl S., Büchner B., Microscopic phase diagram of LaFeAsO single crystals under pressure, *Phys. Rev. B* (accepted) 2018.
20. Zhao J. Y., Bi W., Sinogeikin S., Hu M.Y., Alp E. E., Lin J. F., Jin C. Q., A compact membrane-driven diamond anvil cell and cryostat system for nuclear resonant scattering at high pressure and low temperature, *Rev. Sci. Instrum.* 88, 125109, 2017.
21. Dauphas N., Hu M.Y., Baker E.M., Hu J., Tissot F.L.H., Alp E.E., Roskosz M., Zhao J., Bi W., Liu J., Lin J-F., Nie N.X., Heard A., SciPhon: a data analysis software for nuclear resonant inelastic X-ray scattering with applications to Fe, Kr, Sn, Eu, and Dy, *J. Synchrotron Rad.* 25, 1581, 2018.
22. Materne P., Bi W., Alp E. E., Zhao J., Hu M. Y., Jesche A., Geibel C., Kappenberger R., Aswartham S., Wurmehl S., Büchner B., Zhang D., Goltz T., Spehling J. & Klauss H. H., *Phys. Rev. B.* 98, 14517, 2018.
23. Ying J., Zhao J., Bi W., Alp E.E., Xiao Y., Chow P. and Struzhkin V.V., Unexpected complex magnetic phase diagram of ϵ' -FeH, (submitted) 2018.
24. Liu J., Wang W., Dauphas N., Yang H., Wu Z., Hu M.Y., Zhao J., Bi W., Alp E.E., Liang W., Chen B., Lin J-F., Carbon isotopic signatures of diamond formation mediated by iron redox chemistry, *Geochem. Perp. Let.* (submitted) 2018.
25. Liu J., Hu Q., Bi W., Yang L., Xiao Y., Chow P., Meng Y., Prakapenka V.B., Mao H-K., Mao W.L., Altered chemistry of O, Fe and H in the middle Earth, *Nat. Commun.* (under review) 2018.

Publications: Multi-Anvil Cell Assembly Development ASU (21)

1. Nemeth, P.; Leinenweber, K.; Ohfuji, H.; Groy, T.; Domanik, K.J.; Kovacs, I.J.; Kovacs, J.S.; Buseck, P.R. (2017) Water-bearing, high-pressure Ca-silicates. *Earth and Planetary Science Letters* 469, 148-155.
2. Nisr, C.; Leinenweber, K.; Prakapenka, V.; Prescher, C.; Tkachev, S. and Shim, S-H. (2017) Phase transition and equation of state of dense hydrous silica up to 63 GPa. *J. Geophys. Res.*, 122.
3. Nisr, C.; Shim, S-H.; Leinenweber, K.; Chizmeshya, A. (2017) Raman spectroscopy of water-rich stishovite and dense high-pressure silica up to 55 GPa. *American Mineralogist* 102, 2180-2189.
4. Righter, K.; Guo, B.M.; Pando, K.A.; Danielson, L.; Ross, D.K.; Rahman, Z.; Keller, L.P. (2017) Phase equilibria of a low S and C lunar core: Implications for an early lunar dynamo and physical state of the current core. *Earth and Planetary Science Letters* 463, 323-332.
5. Shu, Y., Yu, D., Hu, W., Wang, Y., Shen, G., Kono, Y., Xu, B., He, J., Liu, Z., Tian, Y. (2017). Deep melting reveals liquid structural memory and anomalous ferromagnetism in bismuth. *Proceedings of the National Academy of Sciences*, 114(13), 3375–3380. <https://doi.org/10.1073/pnas.1615874114>
6. Silber, R.E.; Secco, R.A.; Yong, W.J. (2017) Constant electrical resistivity of Ni along the melting boundary up to 9 GPa. *Journal of Geophysical Research* 122, 5064-5081.

7. Spektor, K.; Wan, W.; Nedumkandathil, R.; Andersson, O.; Haussermann, U. (2017) Crystallization of mesoporous silica SBA-15 in a high pressure hydrothermal environment. *High Pressure Research* 37, 345-349.
8. Stagno, V.; Bindi, L.; Steinhardt, P.J.; Fei, Y.W. (2017) Phase equilibria in the nominally Al₆₅Cu₂₃Fe₁₂ system at 3, 5 and 21 GPa: Implications for the quasicrystal-bearing Khatyrka meteorite. *Physics of the Earth and Planetary Interiors* 271, 47-56.
9. Whitaker, M.L., Baldwin, K.J., and Huebsch, W.R. (2017) DIASCoPE: Directly Integrated Acoustic System Combined with Pressure Experiments – A new method for fast acoustic velocity measurements at high pressure. *Reviews of Scientific Instruments*. 88 (3) 034901
10. Yong, W.; Secco, R.A. (2017) A simple system for low-temperature experiments in a large-volume multi-anvil press. *Review of Scientific Instruments* 88, Article Number 106106.
11. Zhang, Y.; Jin, Z.; Griffin, W.L.; Wang, C.; Wu, Y. (2017) High-pressure experiments provide insights into the Mantle Transition Zone history of chromitite in Tibetan ophiolites. *Earth and Planetary Science Letters* 463, 151-158.
12. Chantel, J.; Jing, Z.C.; Xu, M.; Yu, T.; Wang, Y.B. (2018) Pressure dependence of the liquidus and solidus temperatures in the Fe-P binary system determined by in situ ultrasonics: implications to the solidification of Fe-P liquids in planetary cores. *Journal of Geophysical Research – Planets* 123, 1113-1124.
13. Cheung, C.S.N.; Weidner, D.J.; Li, L.; Meredith, P.G. Chen, H.Y.; Whitaker, M. Chen, X.Y. (2018) Stress distribution during cold compression of rocks and mineral aggregates using synchrotron-based x-ray diffraction. *JOVE – Journal of Visualized Experiments* 135, article number e57555.
14. Dixon, N.A.; Durham, W.B. (2018) Measurement of activation volume for creep of dry olivine at upper-mantle conditions. *Journal of Geophysical Research: Solid Earth*. 10.1029/2018JB015853.
15. Knibbe, J.S.; Luginbuhl, S.M.; Stoevelaar, R.; van der Plas, W; van Harlingen, D.M.; Rai, N.; Steenstra, E.S. van de Geer, R.; van Westrenen, W. (2018) Calibration of a multi-anvil high-pressure apparatus to simulate planetary interior conditions. *EPJ Techniques and Instrumentation* 5, article number 5.
16. Pommier, A. (2018) Influence of sulfur on the electrical resistivity of a crystallizing core in small terrestrial bodies. *Earth and Planetary Science Letters* 496, 37-46.
17. Pommier, A.; Kohlstedt, D.L.; Hansen, L.N.; Mackwell, S.; Tasaka, M.; Heidelbach, F.; Leinenweber, K. (2018) Transport properties of olivine grain boundaries from electrical conductivity experiments. *Contributions to Mineralogy and Petrology* 173, <https://doi.org/10.1007/s00410-018-1468-z>
18. Pommier, A.; Leinenweber, K.D. (2018) Electrical cell assembly for reproducible conductivity experiments in the multi-anvil. *American Mineralogist* 103, 1298-1305.
19. Stoyanov, E.; Leinenweber, K.; Groy, T.L.; Malik, A.S. (2018) Ge_{0.57}Ti_{0.43}O₂: a new high-pressure material with rutile-type crystal structure. *Acta Crystallographica Section E – Crystallographic Communications* 74, 1010-1012.
20. Wang, P; Kumar, R.; Sankaran, E.M.; Qi, X.T.; Zhang, X.Y.; Popov, D.; Cornelius, A.L.; Li, B.S.; Zhao, Y.S.; Wang L.P., Vanadium diboride (VB₂) synthesized at high pressure: elastic, mechanical, electronic, and magnetic properties and thermal stability, *Inorg. Chem.*, 57, 1096-1105, doi: 10.1021/acs.inorgchem.7b02550, 2018.

21. Wang, P.; Wang, Y.G.; Ou, J.Y.; Zhu, Q.; Yang, W.G.; Zhu, J.L.; Wang L.P. WW Zhang, W.W.; DW He, D.W.; YS Zhao, Z.S. (2018) Pressure-induced structural and electronic transitions, metallization, and enhanced visible-light responsiveness in layered rhenium disulfide, *Phys. Rev. B*, B97, 235202, DOI: 10.1103/PhysRevB.97.235202.

Publications: Diamond-Anvil Cell Infrared Facility at the National Synchrotron Light Source II (20)

1. Arveson, S.M., B. Kiefer, J. Deng, Z. Liu and K.M. Lee, Thermally-Induced Coloration of KBr at High Pressures, *Phys. Rev. B: Condens. Matter*, 97, 094103 (2018).
2. H. Chen, M. Li, K. Leinenweber, V. Prakapenka, M. Kunz, H. Bechtel, Z. Liu and S. Shim, Stabilization of Dense Silica Phase in Hydrous Mid-Mantle Regions, *Nature*, submitted
3. Ciezak-Jenkins, J., and T. Jenkins, Shear Induced Weakening of the Hydrogen Bonding Lattice of the Energetic material 5,5'-Hydrazinebistetrazole at High-pressure, *J. Mol. Struct.*, 1129, 313-318 (2017).
4. Duan, P., X. Li, T. Wang, B. Chen, S. Juhl, D. Koeplinger, V. Crespi, J. Badding and K. Schmidt-Rohr, The Chemical Structure of Carbon Nanothreads Analyzed by Advanced Solid-State NMR, *J. Am. Chem. Soc.*, 140(24), 7658-7666 (2018).
5. Hong, F., B Yue, Z. Liu, B. Chen, and H. Mao, Pressure-driven Semiconductor-semiconductor Transition and its Structural Origin in Oxygen Vacancy Ordered SrCoO_{2.5}, *Phys. Rev. B: Condens. Matter*, 95(2), 024115 (2017).
6. Hong, F, B. Yue, X. Wang, Z. Cheng, Z. Wang, M. Kunz, Z. Liu, B. Chen, and H.K. Mao, Pressure and Structure Driven Topological Insulator-Metal Transition in 2D Bi₂Se₃ Nanoflakes, *Nature Materials*, submitted.
7. Jaffe, A., Y. Lin, W. Mao, and H. Karunadasa, Pressure-Induced Metallization of the Halide Perovskite (CH₃NH₃)PbI₃, *J. Am. Chem. Soc.*, 139(12), 4330-4333 (2017).
8. Ke K., Y. Chen, K. Yin, J. Yan, H. Zhang, Z. Liu, J. Tse, J. Wu, H. Mao, B. Chen, Large Bandgap of Pressurized Trilayer Graphene, *Nature Commun.*, submitted
9. Kronenberg, K., H. Hasnan, C. Holyoke III, R. Law, Z. Liu, and J. Thomas, Synchrotron FTIR Imaging of OH in Quartz Mylonites, *Solid Earth* 8, 1025–1045 (2017).
10. Liu, X., Y. Chang, S. Tkachev, C. Bina, and S. Jacobsen, Elastic and Mechanical Softening in Boron-doped Diamond, *Sci. Rep.*, 7, 42921 (2017).
11. Liu, G., L. Kong, J. Gong, W. Yang, H. Mao, Q. Hu, Z. Liu, R. Schaller, D. Zhang, and T. Xu, Pressure-Induced Bandgap Optimization in Lead-Based Perovskites with Prolonged Carrier Lifetime and Ambient Retainability, *Adv. Funct. Mater.*, 27(3), 1604208 (2017).
12. Liu, G., L. Kong, P. Guo, C. Stoumpos, Q. Hu, Z. Liu, Z. Cai, D. Gosztola, H. Mao, M. Kanatzidis, and R. Schaller, Two Regimes of Bandgap Red Shift and Partial Ambient Retention in Pressure-Treated Two- Dimensional Perovskites, *ACS Energy Lett.*, 2, 2518–2524 (2017).
13. Liu, G., J. Gong, L. Kong, R. Schaller, Q. Hu, Z. Liu, S. Yan, W. Yang, C. Stoumpos, et al., Isothermal pressure-derived metastable states in 2D hybrid perovskites showing enduring bandgap narrowing, *Proc Natl Acad Sci USA*, 115 (32) 8076-8081 (2018).

14. Musfeldt, J., K. O'Neal, T. Brinzari, P. Chen, J. Schlueter, J. Manson, A. Litvinchuk, and Z. Liu, Pressure–Temperature Phase Diagram Reveals Spin–Lattice Interactions in $\text{Co}[\text{N}(\text{CN})_2]_2$, *Inorg. Chem.*, 56(9), 4950-4955 (2017).
15. Nisar C., S. Shim, K. Leinenweber, A. Chizmeshya, V. Prakapenka, C. Prescher, S. Tkachev, Y. Meng and Z. Liu, Geophysical Implications of Dense Polymorphs in $\text{Si}_{1-x}\text{H}_4\text{xO}_2$, *Nature Commun.*, submitted.
16. O'Neal, K., A. Clune, N. Harms, S. Cheong, J. Yang, Z. Liu, T. Birol, J. Musfeldt, High-pressure spectroscopic investigation of multiferroic Ni_3TeO_6 , *Phys. Rev. B: Condens. Matter*, 98, 184101 (2018).
17. O'Neal K., A. Clune, N. Harms, S. Cheong, J. Yang, Z. Liu, T. Birol and J. Musfeldt, High pressure spectroscopic investigation of multiferroic Ni_3TeO_6 , *Inorg. Chem.*, submitted.
18. Xi, X., X. Bo, X. Xu, P. Kong, Z. Liu, X. Hong, C. Jin, G. Cao, X. Wan, G. Carr, Honeycomb lattice Na_2IrO_3 at high pressures: A robust spin-orbit Mott insulator, *Phys. Rev. B: Condens. Matter*, 98, 125117 (2018).
19. Zhang H., Q. Li, B. Cheng, Z. Guan, R. Liu, B. Liu, Z. Liu, X. Li, T. Cui, and B. Liu, Structural Transitions and Metallization of Monoclinic Vanadium Dioxide under High Pressure, *J. Phys. Chem. C.*, submitted.
20. Zhang, J., Y. Sorb, H. Deng, H. Xiao, B. Chen, R. Sereika, X. Yin, C. Yi, D. Yan, Y. Shi, Z. Liu, C. Chen, J. Chang, Y. Ding and H.K. Mao, Lattice Frustration in Spin-Orbit Mott Insulator $\text{Sr}_3\text{Ir}_2\text{O}_7$ at High Pressure, *Nature Materials*, submitted.

Publications: PX² at APS (31)

1. Bi, X., et al., Sodium Peroxide Dihydrate or Sodium Superoxide: The Importance of the Cell Configuration for Sodium–Oxygen Batteries. *Small Methods*, 2017. 1(7): p. 1700102.
2. Efthimiopoulos, I., et al., Comparing the Pressure-Induced Structural Behavior of CuCr_2O_4 and CuCr_2Se_4 Spinels. *The Journal of Physical Chemistry C*, 2017. 121(30): p. 16513-16520.
3. Finkelstein, G.J., et al., Single-crystal equations of state of magnesiowüstite at high pressures. *American Mineralogist*, 2017. 102(8): p. 1709. ER SX
4. Hu, Q., et al., Dehydrogenation of goethite in Earth's deep lower mantle. *Proceedings of the National Academy of Sciences of the United States of America*, 2017. 114(7): p. 1498-1501. ER SX
5. Hu, Y., et al., High-Pressure $\gamma\text{-CaMgSi}_2\text{O}_6$: Does Penta-Coordinated Silicon Exist in the Earth's Mantle? *Geophysical Research Letters*, 2017. 44(22): p. 11,340-11,348. ER SX
6. Liu, G., et al., Pressure-Induced Bandgap Optimization in Lead-Based Perovskites with Prolonged Carrier Lifetime and Ambient Retainability. *Advanced Functional Materials*, 2017. 27(3): p. 1604208. SX
7. Qin, F., et al., Thermal Equation of State of Natural Ti-Bearing Clinohumite. *Journal of Geophysical Research: Solid Earth*, 2017. 122(11): p. 8943-8951. ER SX EH
8. Xu, J., et al., Experimental evidence for the survival of augite to transition zone depths, and implications for subduction zone dynamics. *American Mineralogist*, 2017. 102(7): p. 1516-1524. ER SX EH

9. Xu, J., et al., Isosymmetric pressure-induced bonding increase changes compression behavior of clinopyroxenes across jadeite-aegirine solid solution in subduction zones. *Journal of Geophysical Research: Solid Earth*, 2017. 122: p. 142-157. ER SX
10. Zhang, C., et al., Evidence for pressure-induced node-pair annihilation in Cd₃As₂. *Physical Review B*, 2017. 96(15).
11. Zhang, D., Making a fine-scale ruler for oxide inclusions. *American Mineralogist*, 2017. 102(10): p. 1969-1970. ER
12. Zhang, D., et al., High Pressure Single Crystal Diffraction at PX². *Journal of Visualized Experiments*, 2017(119): p. e54660. ER SX
13. Zhang, R., et al., Effects of Nonhydrostatic Stress on Structural and Optoelectronic Properties of Methylammonium Lead Bromide Perovskite. *The Journal of Physical Chemistry Letters*, 2017: p. 3457-3465. SX
14. Efthimiopoulos, I., et al., Universal link of magnetic exchange and structural behavior under pressure in chromium spinels. *Physical Review B*, 2018. 97(18).
15. Gong, J., et al., Red-emitting salicylaldehyde Schiff base with AIE behaviour and large Stokes shift. *Chinese Chemical Letters*, 2018. 29(10): p. 1493-1496. SX
16. Huang, E.W., et al., Irreversible phase transformation in a CoCrFeMnNi high entropy alloy under hydrostatic compression. *Materials Today Communications*, 2018. 14: p. 10-14.
17. Jackson, D.E., et al., Superconducting and magnetic phase diagram of RbEuFe₄As₄ and CsEuFe₄As₄ at high pressure. *Physical Review B*, 2018. 98(1).
18. Lai, X.J., et al., The high-pressure anisotropic thermoelastic properties of a potential inner core carbon-bearing phase, Fe₇C₃, by single-crystal X-ray diffraction. *American Mineralogist*, 2018. 103(10): p. 1568-1574. ER SX EH
19. Li, X., et al., Pressure-induced photoluminescence of MgO. *Journal of Physics-Condensed Matter*, 2018. 30(19).
20. Liu, J.C., et al., Valence and spin states of iron are invisible in Earth's lower mantle. *Nature Communications*, 2018. 9. ER
21. Ma, L., et al., High-Capacity Sodium Peroxide Based Na–O₂ Batteries with Low Charge Overpotential via a Nanostructured Catalytic Cathode. *ACS Energy Letters*, 2018: p. 276-277.
22. Materne, P., et al., Suppression of the magnetic order in CeFeAsO: Nonequivalence of hydrostatic and in-plane chemical pressure. *Physical Review B*, 2018. 98(1).
23. Morrison, R.A., et al., Equations of State and Anisotropy of Fe-Ni-Si Alloys. *Journal of Geophysical Research-Solid Earth*, 2018. 123(6): p. 4647-4675. ER
24. Tang, H., et al., Metal-to-Semiconductor Transition and Electronic Dimensionality Reduction of Ca₂N Electride under Pressure. *Advanced Science*, 2018. 0(0): p. 1800666.
25. Thompson, E.C., et al., High-Pressure Geophysical Properties of Fcc Phase FeHX. *Geochemistry Geophysics Geosystems*, 2018. 19(1): p. 305-314. ER
26. Tschauner, O., et al., Ice-VII inclusions in diamonds: Evidence for aqueous fluid in Earth's deep mantle. *Science*, 2018. 359(6380): p. 1136. ER
27. Xu, J.G., et al., Phase Transitions in Orthoenstatite and Subduction Zone Dynamics: Effects of Water and Transition Metal Ions. *Journal of Geophysical Research-Solid Earth*, 2018. 123(4): p. 2723-2737. ER SX EH

28. Zhang, Q., et al., Pressure Impact on the Crystal Structure, Optical, and Transport Properties in Layered Oxychalcogenides BiCuChO (Ch = S, Se). *Journal of Physical Chemistry C*, 2018. 122(28): p. 15929-15936.

Ph. D. THESES

29. Xu, Jingui, Phase transformations and equation of state of pyroxenes at high pressure and temperature, 2017, University of Chinese Academy of Sciences. ER SX EH
30. Qin, Fei, High-pressure investigation on crystal chemistry of several mineral phases in subduction zones, 2018, Peking University. ER SX EH
31. Hu, Yi, Metastable pyroxenes and their role in the subduction process, 2018, University of Hawaii at Manoa. ER SX EH

Publications: Gas Loading at APS (72)

1. Graeme J. Ackland, Mihindra Dunuwille, Miguel Martinez-Canales, Ingo Loa, Rong Zhang, Stanislav Sinogeikin, Weizhao Cai, Shanti Deemyad, "Quantum and isotope effects in lithium metal," *Science* 356, 1254-1259 (2017). DOI: 10.1126/science.aal4886
2. Jason Baker, "Instrumentation and Measurement of Thermoelectric and Structural Properties of Binary Chalcogenides and Half-Heusler Alloys at Extreme Conditions Using a Paris-Edinburgh Press," Ph.D., University of Nevada, Las Vegas, 2017.
3. Jason L. Baker, Ravhi S. Kumar, Changyong Park, Nenad Velisavljevic, Andrew Cornelius, "Compressibility and thermoelectric behavior of TiCoSb half-Heusler compound at high pressures," *Intermetallics* 95, 137-143 (2018). DOI: 10.1016/j.intermet.2018.02.006
4. I.G. Batyrev, S.P. Coleman, J.A. Ciezak-Jenkins, E. Stavrou, J.M. Zaug, "Modeling and Measurements of the XRD Patterns of Extended Solids under High-Pressure," *Proceedings of the Conference of the American Physical Society Topical Group on Shock Compression of Condensed Matter*, Ricky Chau, Timothy C. Germann, J. Matthew D. Lane, Eric N. Brown, Jon H. Eggert and Marcus D. Knudson, eds., American Institute of Physics (AIP) Publishing (2018), 050003-1. DOI: 10.1063/1.5044786
5. Bin Chen, Xiaojing Lai, Jie Li, Jiachao Liu, Jiyong Zhao, Wenli Bi, E. Ercan Alp, Michael Y. Hu, Yuming Xiao, "Experimental constraints on the sound velocities of cementite Fe₃C to core pressures," *Earth Planet. Sci. Lett.* 494, 164-171 (2018). DOI: 10.1016/j.epsl.2018.05.002
6. Huawei Chen, Sang-Heon Shim, Kurt Leinenweber, Vitali Prakapenka, Yue Meng, Clemens Prescher, "Crystal structure of CaSiO₃ perovskite at 28–62 GPa and 300 K under quasi-hydrostatic stress conditions," *Am. Mineral.* 103 (3), 462-468 (2018). DOI: 10.2138/am-2018-6087
7. Samantha M. Clarke, Maximilian Amsler, James P.S. Walsh, Tony Yu, Yanbin Wang, Yue Meng, Steven D. Jacobsen, Chris Wolverton, Danna E. Freedman, "Creating Binary Cu–Bi Compounds via High-Pressure Synthesis: A Combined Experimental and Theoretical Study," *Chem. Mater.* 29 (12), 5276-5285 (2017). DOI: 10.1021/acs.chemmater.7b01418
8. Kierstin Daviau, Kanani K.M. Lee, "Decomposition of silicon carbide at high pressures and temperatures," *Phys. Rev. B* 96 (17), 174102-1-174102-10 (2017). DOI: 10.1103/PhysRevB.96.174102

9. Kierstin Daviau, Kanani K.M. Lee, "Zinc-blende to rocksalt transition in SiC in a laser-heated diamond-anvil cell," *Phys. Rev. B* 95 (13), 134108-1-134108-6 (2017). DOI: 10.1103/PhysRevB.95.134108
10. Gil Drachuck, Aahish Sapkota, Wageesha T. Jayasekara, Karunakar Kothapalli, Sergey L. Bud'ko, Alan I. Goldman, Andreas Kreyssig, Paul C. Canfield, "Collapsed tetragonal phase transition in LaRu_2P_2 ," *Phys. Rev. B* 96 (18), 184509-1-184509-6 (2017). DOI: 10.1103/PhysRevB.96.184509
11. Yunfei Duan, Xinyang Li, Ningyu Sun, Huaiwei Ni, Sergey N. Tkachev, Zhu Mao, "Single-crystal elasticity of MgAl_2O_4 -spinel up to 10.9GPa and 1000K: Implication for the velocity structure of the top upper mantle," *Earth Planet. Sci. Lett.* 481, 41-47 (2017). DOI: 10.1016/j.epsl.2017.10.014
12. R. Dutta, S.J. Tracy, C.V. Stan, V.B. Prakapenka, R.J. Cava, T.S. Duffy, "Phase stability of iron germanate, FeGeO_3 , to 127 GPa," *Phys. Chem. Miner.* 45 (4), 367-379 (2018). DOI: 10.1007/s00269-017-0927-9
13. R. Dutta, C.E. White, E. Greenberg, V.B. Prakapenka, T.S. Duffy, "Equation of state of the $[\alpha]$ - PbO_2 and Pa3-type phases of GeO_2 to 120 GPa," *Phys. Rev. B* 98 (14), 144106-1-144106-9 (2018). DOI: 10.1103/PhysRevB.98.144106
14. Sakun Duwal, "Chemistries of Hydrogen-Sulfur Compounds, Layered Materials and Nitrogen-Rich Azide under High Pressure," Ph.D., Washington State University, 2018.
15. I. Efthimiopoulos, T. Lochbiler, V. Tsurkan, A. Loidl, V. Felea, Y. Wang, "Structural Behavior of ZnCr_2S_4 Spinel under Pressure," *J. Phys. Chem. C* 121 (1), 769-777 (2017). DOI: 10.1021/acs.jpcc.6b11253
16. Ilias Efthimiopoulos, Indiras Khatri, Zhi T.Y. Liu, Sanjay V. Khare, Pankaj Sarin, Vladimir Tsurkan, Alois Loidl, Dongzhou Zhang, Yuejian Wang, "Universal link of magnetic exchange and structural behavior under pressure in chromium spinels," *Phys. Rev. B* 97 (18), 184435-1-184435-9 (2018). DOI: 10.1103/PhysRevB.97.184435
17. Sabri F. Elatresh, Weizhao Cai, N.W. Ashcroft, R. Hoffmann, S. Deemyad, S.A. Bonev, "Evidence from Fermi surface analysis for the low-temperature structure of lithium," *Proc. Natl. Acad. Sci. USA* 114 (21), 5389-5394 (2017). DOI: 10.1073/pnas.1701994114
18. Dawei Fan, Yunqian Kuang, Jingui Xu, Bo Li, Wenge Zhou, Hongsen Xie, "Thermoelastic properties of grossular-andradite solid solution at high pressures and temperatures," *Phys. Chem. Miner.* 44 (2), 137-147 (2017). DOI: 10.1007/s00269-016-0843-4
19. Gregory J. Finkelstein, Jennifer M. Jackson, Wolfgang Sturhahn, Dongzhou Zhang, E. Ercan Alp, Thomas S. Toellner, "Single-crystal equations of state of magnesiowüstite at high pressures," *Am. Mineral.* 102 (8), 1709-1717 (2017). DOI: 10.2138/am-2017-5966
20. Xinpeng Fu, Fangfei Li, Jung-Fu Lin, Yuanbo Gong, Xiaoli Huang, Yanping Huang, Bo Han, Qiang Zhou, Tian Cui, "Pressure-Dependent Light Emission of Charged and Neutral Excitons in Monolayer MoSe_2 ," *J. Phys. Chem. Lett.* 2017 (8), 3556-3563 (2017). DOI: 10.1021/acs.jpcclett.7b01374
21. Xinpeng Fu, Fangfei Li, Jung-Fu Lin, Yuanbo Gong, Xiaoli Huang, Yanping Huang, Hanxue Gao, Qiang Zhou, Tian Cui, "Coupling-Assisted Renormalization of Excitons and Vibrations in Compressed MoSe_2 - WSe_2 Heterostructure," *J. Phys. Chem. C* 122 (10), 5820-5828 (2018). DOI: 10.1021/acs.jpcc.8b01453

22. Yang Gao, Mi Zhou, Haiyan Wang, Cheng Ji, C.E. Whiteley, J.H. Edgar, Haozhe Liu, Yanzhang Ma, "The high-pressure compressibility of $B_{12}P_2$," *J. Phys. Chem. Solids* 102, 21-26 (2017). DOI: 10.1016/j.jpcs.2016.11.002
23. O. Gomis, B. Lavina, P. Rodriguez-Hernandez, A. Munoz, R. Errandonea, D. Errandonea, M. Bettinelli, "High-pressure structural, elastic, and thermodynamic properties of zircon-type $HoPO_4$ and $TmPO_4$," *J. Phys. Condens. Matter* 29(9), 095401-1-095401- (2017). DOI: 10.1088/1361-648X/aa516a
24. Siyang Guo, Xiaoli Huang, Sergey N. Tkachev, Xinpeng Fu, Jung-Fu Lin, Xinyang Li, Zhu Mao, Qiang Zhou, Fangfei Li, Tian Cui, "Elastic stability of CO_2 phase I under high temperature and pressure," *Phys. Rev. B* 98 (13), 134107-1-134107-8 (2018). DOI: 10.1103/PhysRevB.98.134107
25. Yi Hi, Boris Kiefer, Craig R. Bina, Dongzhou Zhang, Przemyslaw K. Dera, "High-Pressure $[\gamma]$ - $CaMgSi_2O_6$: Does Penta-Coordinated Silicon Exist in the Earth's Mantle?," *Geophys. Res. Lett.* 44 (22), 11340-11348 (2017). DOI: 10.1002/2017GL075424
26. Haw-Tyng Huang, Li Zhu, Matthew D. Ward, Brian L. Chaloux, Rostislav Hrubyak, Albert Epshteyn, John V. Badding, Timothy A. Strobel, "Surprising Stability of Cubane under Extreme Pressure," *J. Phys. Chem. Lett.* 9 (8), 2031-2037 (2018). DOI: 10.1021/acs.jpcllett.8b00395
27. L.Q. Huston, A. Lugstein, J.S. Williams, J.E. Bradby, "The high pressure phase transformation behavior of silicon nanowires," *Appl. Phys. Lett.* 113 (12), 123103-1-123103-5 (2018). DOI: 10.1063/1.5048033
28. Daniel E. Jackson, Derrick Van Gennep, Wenli Bi, Dongzhou Zhang, Philipp Materne, Yi Liu, Guang-Han Cao, Samuel T. Weir, Yogesh K. Vohra, James J. Hamlin, "Superconducting and magnetic phase diagram of $RbEuFe_4As_4$ and $CsEuFe_4As_4$ at high pressure," *Phys. Rev. B* 98 (1), 014518-1-014518-9 (2018). DOI: 10.1103/PhysRevB.98.014518
29. Matthew P. Kroonblawd, Batikan Koroglu, Joseph M. Zaug, Philip F. Pagoria, Nir Goldman, Eran Greenberg, Vitali B. Prakapenka, Martin Kinz, Sorin Bastea, Elissaios Stavrou, "Effects of pressure on the structure and lattice dynamics of ammonium perchlorate: A combined experimental and theoretical study," *J. Chem. Phys.* 149 (3), 034501-1-034501-10 (2018). DOI: 10.1063/1.5030713
30. Barbara Lavina, Robert T. Downs, Stanislav Sinogeikin, "The Structure of Ferroselite, $FeSe_2$, at Pressures up to 46 GPa and Temperatures down to 50 K: A Single-Crystal Micro-Diffraction Analysis," *Crystals* 8 (7), 289-1-289-10 (2018). DOI: 10.3390/cryst8070289
31. Barbara Lavina, Euunja Kim, Hyunhae Cynn, Philippe F. Weck, Kelly Seaborg, Emily Siska, Yue Meng, William Evans, "Phosphorus Dimerization in Gallium Phosphide at High Pressure," *Inorg. Chem.* 57 (5), 2432-2437 (2018). DOI: 10.1021/acs.inorgchem.7b02478
32. John Daniel Lazarz, "Effect of Water on Thermoelasticity of Majoritic Garnet: Implications for the Seismic Structure at the Top of the Lower Mantle," Ph.D., Northwestern University, 2018.

33. Chuanlong Lin, Jesse S. Smith, Stanislav V. Sinogeikin, Yoshio Kono, Changyong Park, Curtis Kenney-Benson, Guoyin Shen, "A metastable liquid melted from a crystalline solid under decompression," *Nat. Commun.* 8, 14260-1-14260-6 (2017). DOI: 10.1038/ncomms14260
34. Chuanlong Lin, Jesse S. Smith, Stanislav V. Sinogeikin, Guoyin Shen, "Effect of stress on melting of rhombohedral bismuth," *Appl. Phys. Lett.* 110 (161904), 161901-1-161904-4 (2017). DOI: 10.1063/1.4981810
35. Jiachao Liu, S.M. Dorfman, Feng Zhu, Jie Li, Yonggang Wang, D. Zhang, Y. Xiao, W. Bi, E. Alp, "Valence and spin states of iron are invisible in Earth's lower mantle," *Nat. Commun.* 9, 1284-1-1284-9 (2018). DOI: 10.1038/s41467-018-03671-5
36. Tomas Marqueño, David Santamaria-Perez, Javier Ruiz-Fuertes, Raquel Chuliá-Jordán, Jose L. Jordá, Fernando Rey, Chris McGuire, Abby Kavner, Simon MacLeod, Dominik Daisenberger, Catalin Popescu, Placida Rodriguez-Hernandez, Alfonso Muñoz, "An Ultrahigh CO₂-Loaded Silicalite-1 Zeolite: Structural Stability and Physical Properties at High Pressures and Temperatures," *Inorg. Chem.* 57 (11), 6447-6455 (2018). DOI: 10.1021/acs.inorgchem.8b00523
37. Philipp Materne, Wenli Bi, Esen Ercan Alp, Jiyong Zhao, Michael Yu Hu, Anton Jesche, Christoph Geibel, Rhea Kappenberger, Saicharan Aswartham, Sabine Wurmehl, Bernd Buchner, Dongzhou Zhang, Til Goltz, Johannes Spehling, Hans-Henning Klauss, "Suppression of the magnetic order in CeFeAsO: Nonequivalence of hydrostatic and in-plane chemical pressure," *Phys. Rev. B* 98 (1), 014517-1-014517-11 (2018). DOI: 10.1103/PhysRevB.98.014517
38. C. McGuire, D. Santamaria-Pérez, A. MakhluF, A. Kavner, "Isothermal equation of state and phase stability of Fe₅Si₃ up to 96 GPa and 3000 K," *J. Geophys. Res.* 122 (6), 4328-4335 (2017). DOI: 10.1002/2017JB014136
39. Christopher McGuire, "Thermal Conductivity Measurements Across a Pressure-Induced Phase Transition: Application to Heat Flow in Earths Interior," Ph.D., University of California, Los Angeles, 2018.
40. Vahe Mkrtchyan, Ravhi Kumar, Melanie White, Howard Yanxon, Andrew Cornelius, "Effect of pressure on crystal structure and superconductivity of NbSe_xTe_{2-x} (x = 2, 1.5)," *Chem. Phys. Lett.* 692, 249-252 (2018). DOI: 10.1016/j.cplett.2017.12.042
41. Morten B. Nielsen, Davide Ceresoli, Jens-Erik Jorgensen, Clemens Prescher, Vitali B. Prakapenka, Martin Bremholm, "Experimental evidence for pressure-induced first order transition in cerium nitride from B1 to B10 structure type," *J. Appl. Phys.* 121 (2), 025903-1-025903-9 (2017). DOI: 10.1063/1.4973575
42. C. Nisr, K. Leinenweber, V. Prakapenka, C. Prescher, S. Tkachev, S.-H. Shim, "Phase Transition and Equation of State of Dense Hydrous Silica up to 63 GPa," *J. Geophys. Res.* 122 (9), 6972-6983 (2017). DOI: 10.1002/2017JB014055
43. Carole Nisr, Yue Meng, A.A. MacDowell, J. Yan, V. Prakapenka, S.-H. Shim, "Thermal expansion of SiC at high pressure-temperature and implications for thermal convection in the deep interiors of carbide exoplanets," *J. Geophys. Res.* 122 (1), 124-133 (2017). DOI: 10.1002/2016JE005158
44. C. Prescher, Yu D. Fromin, V.B. Prakapenka, J. Stefanski, K. Trachenkoo, V.V. Brazhkin, "Experimental evidence of the Frenkel line in supercritical neon," *Phys. Rev. B* 95 (13), 134114-1-134114-7 (2017). DOI: 10.1103/PhysRevB.95.134114

45. Fei Qin, Xiang Wu, Dongzhou Zhang, Shan Qin, Steven D. Jacobsen, "Thermal Equation of State of Natural Ti-Bearing Clinohumite," *J. Geophys. Res.* 122 (11), 8943-8951 (2017). DOI: 10.1002/2017JB014827
46. Selva Vennila Raju, Rostislav Hrubik, Vadym Drozd, Surendra Saxena, "Laser-Assisted Processing of Ni-Al-Co-Ti Under High Pressure," *Mater. Manuf. Process* 32 (14), 1606-1611 (2017). DOI: 10.1080/10426914.2016.1269913
47. David Santamaria-Perez, Tomas Marqueno, Simon MacLeod, Javier Ruiz-Fuertes, Dominik Daisenberger, Raquel Chulia-Jordan, Daniel Errandonea, Jose Luis Jorda, Fernando Rey, Chris McGuire, Adam Mahkluf, Abby Kavner, Catalin Popescu, "Structural Evolution of CO₂-Filled Pure Silica LTA Zeolite under High-Pressure High-Temperature Conditions," *Chem. Mater.* 29 (10), 4502-4510 (2017). DOI: 10.1021/acs.chemmater.7b01158
48. Hannah Shelton, Tiange Bi, Eva Zurek, Jesse Smith, Przemyslaw Dera, "The Ideal Crystal Structure of Cristobalite X-I: A Bridge in SiO₂ Densification," *J. Phys. Chem. C* 122 (30), 17437-17446 (2018). DOI: 10.1021/acs.jpcc.8b04282
49. Hannah Shelton, Przemyslaw Dera, Sergey Tkachev, "Evolution of Interatomic and Intermolecular Interactions and Polymorphism of Melamine at High Pressure," *Crystals* 8 (7), 265-1-265-20 (2018). DOI: 10.3390/cryst8070265
50. Ratnadwip Singha, Sudeshna Samanta, Swastika Chatterjee, Arnab Pariari, Dipanwita Majumdar, Biswarup Satpati, Lin Wang, Achintya Singha, Prabhat Mandal, "Probing lattice dynamics and electron-phonon coupling in the topological nodal-line semimetal ZrSiS," *Phys. Rev. B* 97 (9), 094112-1-094112-12 (2018). DOI: 10.1103/PhysRevB.97.094112
51. Camelia V. Stan, Rajkrishna Dutta, Robert J. Cava, Vitali B. Prakapenka, Thomas S. Duffy, "High-Pressure Study of Perovskites and Postperovskites in the (Mg,Fe)GeO₃ System," *Inorg. Chem.* 56 (14), 8026-8035 (2017). DOI: 10.1021/acs.inorgchem.7b00774
52. Elissaios Stavrou, Yansun Yao, Alexander F. Goncharov, Sergey S. Lobanov, Joseph M. Zaugg, Hanyu Liu, Eran Greenberg, Vitali B. Prakapenka, "Synthesis of Xenon and Iron-Nickel Intermetallic Compounds at Earth's Core Thermodynamic Conditions," *Phys. Rev. Lett.* 120 (9), 096001-1-096001-6 (2018). DOI: 10.1103/PhysRevLett.120.096001
53. E.C. THOMPSON, "MINERAL PHYSICS OF HYDROGEN-BEARING PHASES IN THE DEEP EARTH," Ph.D., University of Chicago, 2018.
54. R. Thiyagarajan, X. Yan, V. Pazhanivelu, A.P.B. Selvadurai, R. Murugaraj, W. Yang, "Doping effect of alkali metal elements on the structural stability and transport properties of ZnO at high pressures," *J. Alloy Comp.* 751, 266-274 (2018). DOI: 10.1016/j.jallcom.2018.04.016
55. Yishu Wang, T.F. Rosenbaum, A. Palmer, Y. Ren, J.-W. Kim, D. Mandrus, Y. Feng, "Strongly-coupled quantum critical point in an all-in-all-out antiferromagnet," *Nat. Commun.* 9, 2953-1-2953-7 (2018). DOI: 10.1038/s41467-018-05435-7
56. Ye Wu, Xi Han, Haijun Huang, "Structural Transformation Pathways of Multiferroic BiFeO₃ under High Pressures," *J. Phys. Chem. C* 122 (12), 6852-6857 (2018). DOI: 10.1021/acs.jpcc.8b00977
57. Ye Wu, Hanyu Liu, Haijun Huang, Yingwei Fei, Xiaolei Feng, Simon A.T. Redfern, "Pressure-induced structural modulations in coesite," *Phys. Rev. B* 98 (10), 104106-1-104106-9 (2018). DOI: 10.1103/PhysRevB.98.104106

58. Sheng-Yi Xie, Luhong Wang, Fuyang Liu, Xian-Bin Li, Ligang Bai, Vitali B. Prakapenka, Zhonghou Cai, Ho-Kwang Mao, Shengbai Zhang, Haozhe Liu, "Correlated High-Pressure Phase Sequence of VO₂ under Strong Compression," *J. Phys. Chem. Lett.* 9 (9), 2388-2393 (2018). DOI: 10.1021/acs.jpcllett.8b00771
59. Jingui Xu, Dongzhou Zhang, Przemyslaw Dera, Bo Zhang, Dawei Fan, "Experimental evidence for the survival of augite to transition zone depths, and implications for subduction zone dynamics," *Am. Mineral.* 102 (7), 1516-1524 (2017). DOI: 10.2138/am-2017-5959
60. Jingui Xu, Dongzhou Zhang, Dawei Fan, Robert T. Downs, Yi Hu, Przemyslaw K. Dera, "Isosymmetric pressure-induced bonding increase changes compression behavior of clinopyroxenes across jadeite-aegirine solid solution in subduction zones," *J. Geophys. Res.* 122 (1), 142-157 (2017). DOI: 10.1002/2016JB013502
61. Jingui Xu, Dongzhou Zhang, Dawei Fan, Jin S. Zhang, Yi Hu, Xinzhuan Guo, Przemyslaw Dera, Wenge Zhou, "Phase Transitions in Orthoenstatite and Subduction Zone Dynamics: Effects of Water and Transition Metal Ions," *J. Geophys. Res.* 123 (4), 2723-2737 (2018). DOI: 10.1002/2017JB015169
62. W.M. Xu, G.R. Hearne, S. Layek, D. Levy, M.P. Pasternak, G.Kh. Rozenberg, E. Greenberg, "Interplay between structural and magnetic-electronic responses of FeAl₂O₄ to a megabar: Site inversion and spin crossover," *Phys. Rev. B* 97 (8), 085120-1-085120-9 (2018). DOI: 10.1103/PhysRevB.97.085120
63. Y. Ye, V. Prakapenka, Y. Meng, S.-H. Shim, "Intercomparison of the gold, platinum, and MgO pressure scales up to 140 GPa and 2500 K," *J. Geophys. Res.* 122 (5), 3450-3464 (2017). DOI: 10.1002/2016JB013811
64. Jianjun Ying, Lingyun Tang, Fei Chen, Xianhui Chen, Viktor V. Struzhkin, "Coexistence of metallic and insulating channels in compressed YbB₆," *Phys. Rev. B* 97 (12), 121101-1-121101-5 (2018). DOI: 10.1103/PhysRevB.97.121101
65. Dongzhou Zhang, Przemyslaw K. Dera, Peter J. Eng, Joanne E. Stubbs, Jin S. Zhang, Vitali B. Prakapenka, Mark L. Rivers, "High Pressure Single Crystal Diffraction at PX²," *J. Vis. Exper.* 119, e54660-1-e54660-9 (2017). DOI: 10.3791/54660
66. Fei Zhang, Yuan Wu, Hongbo Lou, Zhidan Zeng, Vitali B. Prakapenka, Eran Greenberg, Yang Ren, Jinyuan Yan, John S. Okasinski, Xiongjun Liu, Yong Liu, Qiaoshi Zeng, Zhaoping Lu, "Polymorphism in a high-entropy alloy," *Nat. Commun.* 8, 15687-1-15687-7 (2017). DOI: 10.1038/ncomms15687
67. Jin S. Zhang, Yi Hu, Hannah Shelton, Jennifer Kung, Przemyslaw Dera, "Single-crystal X-ray diffraction study of Fe₂SiO₄ fayalite up to 31 GPa," *Phys. Chem. Miner.* 44 (3), 171-179 (2017). DOI: 10.1007/s00269-016-0846-1
68. Rong Zhang, Weizhao Cai, Tiange Bi, Niloofar Zarifi, Tyson Terpstra, Chuang Zhang, Z. Valy Verdant, Eva Zurek, Shanti Deemyad, "Effects of Nonhydrostatic Stress on Structural and Optoelectronic Properties of Methylammonium Lead Bromide Perovskite," *J. Phys. Chem. Lett.* 2017 (8), 3457-3465 (2017). DOI: 10.1021/acs.jpcllett.7b01367
69. Yanyao Zhang, Xi Liu, Sean R. Shieh, Xinjian Bao, Tianqi Xie, Fei Wang, Zhigang Zhang, Clemens Prescher, Vitali B. Prakapenka, "Spinel and post-spinel phase assemblages in Zn₂TiO₄: an experimental and theoretical study," *Phys. Chem. Miner.* 44 (2), 109-123 (2017). DOI: 10.1007/s00269-016-0841-6

70. Fei Zhang, Hongbo Lou, Songyi Chen, Xiehang Chen, Zhidan Zeng, Jinyuan Yan, Wuxin Zhao, Yuan Wu, Zhaoping Lu, Qiaoshi Zeng, "Effects of non-hydrostaticity and grain size on the pressure-induced phase transition of the CoCrFeMnNi high-entropy alloy," *J. Appl. Phys.* 124 (11), 115901-1-115901-5 (2018). DOI: 10.1063/1.5046180
71. Xiao Zhang, Wan Xu, Yu Wang, Shuqing Jiang, Federico A. Gorelli, Eran Greenberg, Vitali B. Prakapenka, Alexander F. Goncharov, "Synthesis and properties of selenium trihydride at high pressures," *Phys. Rev. B* 97 (6), 064107-1-064107-7 (2018). DOI: 10.1103/PhysRevB.97.064107
72. J.Y. Zhao, W. Bi, S. Sinogeikin, M.Y. Hu, E.E. Alp, X.C. Wang, C.Q. Jin, J.F. Lin, "A compact membrane-driven diamond anvil cell and cryostat system for nuclear resonant scattering at high pressure and low temperature," *Rev. Sci. Instrum.* 88 (12), 125109-1-125109-6 (2017). DOI: 10.1063/1.4999787

Publications: COMPRES Multi-anvil Program at NSLS-II and APS (28)

1. Cheung, S. N. C.; Weidner, D. J.; Li, L.; Meredith, P. G.; Chen, H.; Whitaker, M. L.; Chen, X. (2017) Stress distribution during cold compression of a quartz aggregate using synchrotron X-ray diffraction: observed yielding, damage and grain crushing. *Journal of Geophysical Research (Solid Earth)*, 122 (4) 2724-2735
2. Whitaker, M.L., Baldwin, K.J., and Huebsch, W.R. (2017) DIASCoPE: Directly Integrated Acoustic System Combined with Pressure Experiments – A new method for fast acoustic velocity measurements at high pressure. *Reviews of Scientific Instruments*. 88 (3) 034901
3. Farla R., Amulele G., Girard J., Miyajima N., Karato SI., (2017) High-pressure and high-temperature deformation experiments on polycrystalline wadsleyite using the rotational Drickamer apparatus (vol 42, pg 541, 2015), *Physics and Chemistry of Minerals* 44 (3) 235
4. L. Tokle, G. Hirth, P. Raterron, N. Dygert, Y. Liang, C. W. Holyoke , "The Pressure and Mg Dependence of Ilmenite and Ilmenite-olivine Aggregates Rheology: Implications for Lunar Cumulate Mantle Overturn", *Lunar Planetary Science Conference Abstracts*, April, 2017
5. P. Raterron, L. Tokle, N. Hilairat, S. Merkel, G. Hirth, D. Weidner , "Effect of Fe Content on Olive Viscosity and Implications for the Martian Mantle", *Lunar Planetary Science Conference Abstracts*, April, 2017
6. GN. Zhang, SH. Mei, MS. Song, D. L. Kohlstedt, "Diffusion Creep of Enstatite at High Pressures Under Hydrous Conditions", *Journal of Geophysical Research: Solid Earth*, 122, 7718-7728, 2017, doi:10.1002/2017JB014400
7. S. Kaboli, P. C. Burnley, G. Xia and H. W. Green II "Pressure dependence of creep in forsterite olivine: comparison of measurements from the D-DIA and Griggs apparatus", *Geophysical Research Letters*, 44 (21) 10939-10947 2017, DOI: 10.1002/2017GL075177
8. S. Kaboli and P. Burnley, "ECCI, EBSD and EPSC Characterization of Rhombohedral Twinning in Polycrystalline α -Alumina Deformed in the D-DIA Apparatus", *Journal of Applied Crystallography*, 50 (6) 1691-1704, 2017
9. S. Kaboli and P. Burnley, "Applications of Electron Channeling Contrast Imaging (ECCI) in Failure Analysis of In-Situ Synchrotron X-Ray Diffraction Deformation Experiments", *Microscopy and Microanalysis* , 23 (S1), 568-569, 2017

10. MJ Rucks, TD Glotch, ML Whitaker, JB Parise, "Investigation of tssintite formation using in-situ synchrotron X-ray diffraction and multi-anvil techniques", *Meteoritics & Planetary Science*, 52 (2017) Page A 298
11. YT Zou, Y Li, HY Chen, D Welch, YS Zhao, BS Li, "Thermalelasticity and anomalies in the pressure dependence of phonon velocities in niobium", *Applied Physical Letters*, 112 011901 2018
12. DJ Weidner, L LI, ML Whitaker, R Triplett, "Ultrasonic Acoustic Velocities During Partial Melting of a Mantle Peridotite KLB-1", *Journal of Geophysical Research: Solid Earth*, 123 (2018) 1252-1261
13. CSN Cheung, DJ Weidner, L LI, PG Meredith, HY Chen, ML Whitaker, XY Chen, "Stress Distribution During Cold Compression of Rocks and Mineral Aggregates Using Synchrotron-based X-Ray Diffraction", *JOVE*, 135, 2018, Doi: 10.3791/57555
14. A James, MMD Esfahani, WR Woerner, A Sinclair, L Ehm, AR Oganov, JB Parise, "Theoretical and Experimental Investigations into Novel Oxynitride Discovery in the GaN-TiO₂ System at High Pressure", *Crystals*, 2 (2018) Article 15, Doi: 10.3390/cryst8020015
15. MJ Rucks, ML Whitaker, TD Glotch, JB Parise, "Formation of Tssintite and Its Implications for Impact Studies", *Lunar and Planetary Science Conference*, Volume 49 (2018/3)
16. F Bejina, M Bystycky, N Terce, ML Whitaker, HY Chen, "Bulk modulus of Fe-rich olivines corrected for non hydrostaticity", *Comptes Rendus Geoscience*, <https://doi.org/10.1016/j.crte.2018.06.002>
17. MJ Rucks, ML Whitaker, TD Glotch, JB Parise, SJ Jaret, T Catalano, MD Dyar, "Making Tssintite: Mimicking meteorite in the multi-anvil" *American Mineralogist*, 103 (2018) 1516-1519. (Editor's Highlight!)
18. L Li, ML Whitaker, DJ Weidner, "Note: Elastic wave velocity measurement using ultrasonic system with two-reflectors" *Review of Scientific Instruments*, 89 (8) (2018) Article # 086105
19. L Li, DJ Weidner, ML Whitaker, R Triplett, "Ultrasonic Acoustic Wave Velocities of Neighborite (NaMgF₃) Across Orthorhombic to Cubic Phase Boundary at High P-T", *Physics of the Earth and Planetary Interiors*, 283 (2018) 38-42
20. Kaboli, S. and Burnley P.C., (in press) In-situ X-ray Diffraction Deformation and EPSC Modeling of AZ31 Mg Alloy. *Materials Science & Engineering A* (Submitted 8/20/2018)
21. Burnley P. C. and Kaboli S. (in press) Elastic Plastic Self Consistent (EPSC) Modeling of San Carlos Olivine Deformed in a D-DIA Apparatus. *American Mineralogist* (submitted 6/1/2018)
22. Mohiuddin a., Karato S-I., Girard J., "Simulating deep slab deformation by synchrotron in-situ high-pressure experiment", *Nature Geosciences* (submitted)
23. Hansen, L.N.; Thom, C.A.; Kumamoto, K.M.; Wallis, D.; Durham, W.B.; Goldsby, D.L.; Breithaupt, T.; and Kohlstedt, D.L "Low-temperature plasticity in olivine: Grain size, strain hardening, and the strength of the lithosphere". *Journal of Geophysical Research: Solid Earth*. (submitted)

PhD THESES

24. Dharmagunawardhane, HAN (2017) Synthesis of oxynitride materials for solar water splitting: investigations with ambient pressure and high pressure synthesis techniques, Ph. D. Thesis, Stony Brook University

25. Chen, T (2017) Elasticity of Coesite and Stishovite: Implications for the Earth's Mantle, Ph. D. Thesis, Stony Brook University
26. Kumamoto, K (2018) Exploring the rheological properties of the upper mantle : from the field to the laboratory, Ph. D. Thesis, Stanford Univeristy

Masters THESES

27. Millard, Joseph (2018) "Pressure Dependence Of The Strength Of Magnesite Deforming By Low Temperature Plasticity, Diffusion Creep, Or Dislocation Creep", University of Akron, http://rave.ohiolink.edu/etdc/view?acc_num=akron1526913343559104
28. McDaniel, Caleb (2018) "Effect of grain size on the strength of magnesite deforming by diffusion creep or low temperature plasticity mechanisms." University of Akron, http://rave.ohiolink.edu/etdc/view?acc_num=akron1526571269872349