Eric J. Peterson Curriculum Vitae

EDUCATION
B.S. University of New Mexico Geology (Chemistry minor) Spring, 1978.
Ph.D. University of New Mexico Nanoscience and Microsystem Engineering (Chemical Engineering minor) Fall 2014

HONORS AND AWARDS
2009 Western States Catalysis Club 2nd place Student Talk Award
2011 North American Catalysis Society Kokes Award

EMPLOYMENT
1984-1993 Los Alamos National Laboratory, Chemical Technician
1993-2004 Los Alamos National Laboratory, Technical Staff Member
2008-2014 University of New Mexico, Research Assistant
2015- University of New Mexico, Post Doc

PAST AREAS OF RESEARCH INTEREST
-Synthesis and characterization of ceramic high T_c superconductors
-Rietveld analysis/ X-ray/Neutron diffraction
-High T_c superconductor crystal structure and microstructure
-Crystal structure of uranium alloys
-Crystal structure of Laves phases
-Analysis of oxide buffer-layer and superconducting films
-Texture analysis
-Size/strain analysis

CURRENT AREAS OF RESEARCH INTEREST
-Heterogeneous catalysis
-Synthesis, structure and properties of metallic and intermetallic nanoparticles for catalysis.
-Rietveld analysis/ X-ray/Neutron diffraction
-X-ray absorption spectroscopy.
-Aerosol synthesis of bimetallic alloys for catalysis.
-Single-atom heterogeneous catalysis.

PRESENTATIONS (PRESENTING AUTHOR)
1. Stabilization of Pd sintering on La-stabilized gamma-alumina 22nd North American Catalysis Society Meeting 2011 Detroit

2. Stable Sub-Nanometer Pd Species on Alumina Surfaces 21st North American Catalysis Society Meeting 2009 San Francisco

3. *Alumina-Supported Palladium Catalyst Crystallite Size Determination by EXAFS,* XRD, and TEM. 57th Denver X-Ray Conference 2008 Denver

4. *Synthesis and Characterization Of PdZn Catalyst For Steam Reforming Of Methanol.* American Chemical Society 2008 New Orleans

5. *Intensity Vs. Resolution And Peak Shape In X-Ray Diffraction: Single And Double Goebel Mirror Configurations Compared to Standard Parafocusing Optics.* ICDD Meeting 2003Philadephia

6. *Rietveld Refinements of U-Nb Alloys.* 51st Denver X-Ray Conference 2002 Colorado Springs

7. *X-Ray Diffraction Mapping Of YBCO Superconducting Tape on a Mesostructural Scale.* Materials Research Society 2001 Boston

8. *Neutron Diffraction Analysis Of (Y,RE)Ba(2)Cu(3)O(7-x) (RE=Yb,Er, Ho,Dy).* Hippo Neutron Diffractometer Workshop 2001Santa Fe

9. *X-Ray Diffraction Analysis of BSCCO And YBCO Superconducting Films.* (Invited) American Ceramic Society Cincinnati 1997

10. *Thermo-Mechanical Processing Of Silver Alloy-Clad Tl-1223 Superconducting Tapes.* Materials Research Society Boston 1996

11. *Two-Compound Syntheses of Single Layer Thallium Superconductors. (Invited)* Materials Research Society Boston 1995

12. *Production of Thallium Single-Layer Superconductor Powders by the Two Zone Method* Materials Research Society Spring San Francisco 1994

13. *Bulk and Powder In Tube Processing Of Tl1-xPbx(Ba0.2Sr0.8)2Ca2Cu30x 1223 Superconductor*. Materials Research Society Boston 1993

14. *Precursor Route Synthesis And Characterization Of Tl1- xPbx(Ba0.2Sr0.8)2Ca2Cu30x1223 Superconductor*. Materials Research Society San Francisco 1993

15. *XRD Crystallite Size and Strain Analysis of BSCCO Superconducting Thin Films*. 41st Denver X-Ray Conference Colorado Springs 1992

PATENT

Superconducting structure including mixed rare earth barium-copper compositions
United States Patent PCT/US1999/020949 Issued September 14, 1999
C. Kwon; Q. Jia, S. R. Foltyn, J. L. Smith, E. J. Peterson, and W. L. Hults.

JOURNAL ARTICLES

1. Peterson, E.J.; DeLaRiva, A.T.; Johnson, R.S.; Guo, H.; Miller, J.T.; Kwak, J-H.; Peden, C.H.F.; Kiefer, B.; Allard, L.F.; Ribiero, F.H.; Datye, A.K. Low-Temperature Carbon Monoxide Oxidation Catalysed by Regenerable Atomically Dispersed Palladium on Alumina. Nature Communications **09/2014**; 5.

2. Gaudet, J. R.; de la Riva, A.; Peterson, E. J.; Bolin, T.; Datye, A. K., Improved Low-Temperature CO Oxidation Performance of Pd Supported on La-Stabilized Alumina. *ACS Catalysis* **2013,** *3* (5), 846-855.

3. Paiz, J.; Fitch, J.; Peterson, E.; Hough,T.; Barnard,W.; Datye, K; *Synthesis of PdO-ZnO mixed oxide precursors for PdZn intermetallic catalysts*. Crystal Research and Technology 09/**2014**; 49(9).

4. Johns, T.R.; Gaudet, J.R.; Peterson, E.J.; Miller, J.T.; Stach,E.A.; Kim, C.H.; Balogh,M.P.; Datye, A.K.; *Microstructure of Bimetallic PtPd Catalysts under Oxidizing Conditions*. ChemCatChem 01/**2013**; 5(9).

5. Pylypenko, S.; Peterson, E. J.; Halevi, B.; Champagne, E.; Olson, T. S.; Atanassov, P., Hierarchically Structured Pt-Alloy Ethanol Oxidation Electrocatalysts. *Electrocatalysis* **2012,** *3* (3-4), 334-345.

6. Halevi, B.; Peterson, E. J.; Roy, A.; DeLariva, A.; Jeroro, E.; Gao, F.; Wang, Y.; Vohs, J. M.; Kiefer, B.; Kunkes, E.; Havecker, M.; Behrens, M.; Schlogl, R.; Datye, A. K., Catalytic reactivity of face centered cubic PdZn alpha for the steam reforming of methanol. *Journal of Catalysis* **2012,** *291*, 44-54.

7. Lebarbier, V. M.; Karim, A. M.; Engelhard, M. H.; Wu, Y.; Xu, B.-Q.; Petersen, E. J.; Datye, A. K.; Wang, Y., The Effect of Zinc Addition on the Oxidation State of Cobalt in Co/ZrO2 Catalysts. *ChemSusChem* **2011,** *4* (11), 1679-1684.

8. Peterson, E. J.; Halevi, B.; Kiefer, B.; Spilde, M. N.; Datye, A. K.; Peterson, J.; Daemen, L.; Llobet, A.; Nakotte, H., Aerosol synthesis and Rietveld analysis of tetragonal (beta(1)) PdZn. *Journal of Alloys and Compounds* **2011,** *509* (5), 1463-1470.

9. Halevi, B.; Peterson, E. J.; Delariva, A.; Jeroro, E.; Lebarbier, V. M.; Wang, Y.; Vohs, J. M.; Kiefer, B.; Kunkes, E.; Havecker, M.; Behrens, M.; Sehlogl, R.; Datye, A. K., Aerosol-Derived Bimetallic Alloy Powders: Bridging the Gap. *Journal of Physical Chemistry C* **2011,** *114* (40), 17181-17190.

10. Burton, P. D.; Peterson, E. J.; Boyle, T. J.; Datye, A. K., Synthesis of High Surface Area ZnO(0001) Plates as Novel Oxide Supports for Heterogeneous Catalysts. *Catalysis Letters* **2011,** *139* (1-2), 26-32.

11. Hettinger, J. D.; Cooley, J. C.; Hackenberg, R. E.; Peterson, E. J.; Kelly, A. M.; Papin, P. A.; Smith, J. L.; de Visser, A.; Graf, M. J., Specific heat and materials analysis on U1-xThxPt3 for 0 <= x <= 0.05. *Physica B-Condensed Matter* **2005,** *359*, 1066-1068.

12. Day, G. A.; Hoover, M. D.; Stefaniak, A. B.; Dickerson, R. M.; Peterson, E. J.; Esmen, N. A.; Scripsick, R. C., Bioavailability of beryllium oxide particles: An in vitro study in the murine J774A.1 macrophage cell line model. *Experimental Lung Research* **2005,** *31* (3), 341-360.

13. Stefaniak, A. B.; Hoover, M. D.; Day, G. A.; Dickerson, R. M.; Peterson, E. J.; Kent, M. S.; Schuler, C. R.; Breysse, P. N.; Scripsick, R. C., Characterization of physicochemical properties of beryllium aerosols associated with prevalence of chronic beryllium disease. *Journal of Environmental Monitoring* **2004,** *6* (6), 523-532.

14. Thoma, D.J., R.E. Hackenberg, W.L. Hults, L.B. Dauelsberg, J.C. Cooley, J.F. Smith, D.E. Peterson, M.E. Manley, M.E. Mauro, A.M. Kelly, R.D. Field, P.A. Papin, D.J. Brown, C.M. Cady, and K. Eckelmeyer., LA-43 Uranium Characterization LA-UR-03-0167 **2003** 15 pages.

15. Stefaniak, A. B.; Hoover, M. D.; Dickerson, R. M.; Peterson, E. J.; Day, G. A.; Breysse, P. N.; Kent, M. S.; Scripsick, R. C., Surface area of respirable beryllium

metal, oxide, and copper alloy aerosols and implications for assessment of exposure risk of chronic beryllium disease. *AIHA Journal* **2003,** *64* (3), 297-305.

16. Teter D. F., Tubesing P. K. , Thoma D. J. & E., P. Density Prediction of Uranium-6 Niobium Ingots. LA-14022-MS **2003**, 10 pages.

17. Drymiotis, F.; Lashley, J. C.; Fisk, Z.; Peterson, E.; Nakatsuji, S., Physical properties of the beta-Ti6Sn5 system. *Philosophical Magazine* **2003,** *83* (27), 3169- 3178.

18. Zhu, Y. T.; Shu, L.; Peterson, E. J.; Peterson, D. E.; Mueller, F. M., Rietveld refinement of crystal chemistry of RBa4Cu3O8.5+delta (R = rare earth). *Journal of Physics and Chemistry of Solids* **2002,** *63* (1), 23-29.

19. Peterson, E. J.; Hults, W. L.; Simpson, M.; Coulter, J. Y.; Smith, J. L., Micro- strain in Y0.5R0.5Ba2Cu3O7-x (R=Yb, Tm, Er, Ho, Dy, Gd, Eu, Sm, AND Nd). *Advances in X-ray Analysis* **2002,** *45*, 238-244.

20. Groves, J. R.; Arendt, P. N.; Foltyn, S. R.; Jia, Q. X.; Holesinger, T. G.; Kung, H.; DePaula, R. F.; Dowden, P. C.; Peterson, E. J.; Stan, L.; Emmert, L. A., Recent progress in continuously processed IBAD MgO template meters for HTS applications. *Physica C-Superconductivity and Its Applications* **2002,** *382* (1), 43-47.

21. Serquis, A.; Zhu, Y. T.; Peterson, E. J.; Coulter, J. Y.; Peterson, D. E.; Mueller, F. M., Effect of lattice strain and defects on the superconductivity of MgB2. *Applied Physics Letters* **2001,** *79* (26), 4399-4401.

22. Peng, L. S. J.; Wang, W. Z.; Jo, W.; Ohnishi, T.; Marshall, A. F.; Hammond, R. H.; Beasley, M. R.; Peterson, E. J.; Ericson, R. E., In situ high rate growth of high temperature superconductor tapes. *Ieee Transactions on Applied Superconductivity* **2001,** *11* (1), 3375-3378.

23. Park, B. H.; Peterson, E. J.; Lee, J.; Zeng, X.; Si, W.; Xi, X. X.; Jia, Q. X., Dielectric properties of Ba0.6Sr0.4TiO3 thin films with various strain states. *Integrated Ferroelectrics* **2001,** *39* (1-4), 1221-1230.

24. Park, B. H.; Peterson, E. J.; Jia, Q. X.; Lee, J.; Zeng, X.; Si, W.; Xi, X. X., Effects of very thin strain layers on dielectric properties of epitaxial Ba0.6Sr0.4TiO3 films. *Applied Physics Letters* **2001,** *78* (4), 533-535.

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26. Groves, J. R.; Yashar, P. C.; Arendt, P. N.; DePaula, R. F.; Peterson, E. J.; Fitzsimmons, M. R., Ultra-thin bi-axially textured IBAD MgO template layers resolved by grazing incidence X-ray diffraction. *Physica C* **2001,** *355* (3-4), 293-298.

27. Groves, J. R.; Arendt, P. N.; Foltyn, S. R.; Jia, Q. X.; Holesinger, T. G.; Kung, H.; Peterson, E. J.; DePaula, R. F.; Dowden, P. C.; Stan, L.; Emmert, L. A., High critical current density YBa2Cu3O7-delta thick films using ion beam assisted deposition MgO bi-axially oriented template layers on nickel-based superalloy substrates. *Journal of Materials Research* **2001,** *16* (8), 2175-2178.

28. Chen, K. C.; Peterson, E. J.; Thoma, D. J., HfCo2 Laves phase intermetallics - part I: solubility limits and defect mechanisms. *Intermetallics* **2001,** *9* (9), 771-783.

29. Willis, J. O.; Arendt, P. N.; Foltyn, S. R.; Jist, Q. X.; Groves, J. R.; DePaula, R. F.; Dowden, P. C.; Peterson, E. J.; Holesinger, T. G.; Coulter, J. Y.; Ma, M.; Maley, M. P.; Peterson, D. E., Advances in YBCO-coated conductor technology. *Physica C* **2000,** *335* (1-4), 73-77.

30. Zhu, Y. T.; Peterson, E. J.; Baldonado, P. S.; Coulter, J. Y.; Peterson, D. E.; Mueller, F. M., Synthesis and crystal chemistry of the new compounds GdBa4Cu3O8.5+delta and DyBa4Cu3O8.5+delta. *Journal of Materials Research* **1999,** *14* (2), 334-339.

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S. P.; Cox, S. F. J.; Godart, C.; Gupta, L. C.; Hossain, Z.; Hults, W. L.; Jestadt, T.; Peterson, E. J.; Pratt, F. L.; Smith, J. H. L., Nature of the spin state in TmNi2B2C. *Physica B-Condensed Matter* **1999,** *259-61*, 588-589.

33. Groves, J.; Arendt, P.; Jia, Q.; Foltyn, S.; DePaula, R.; Dowden, P.; Kinder, L.; Fan, Y.; Peterson, E., High critical current density PLD YBCO deposited on highly textured IBAD MgO buffer layers. *Ceramic Transactions* **1999,** *104*, 219-226.

34. Zhu, Y. T.; Peterson, E. J.; Baldonado, P. S.; Coulter, J. Y.; Peterson, D. E.; Mueller, F. M., Synthesis and characterization of the new compound EuBa4Cu3O8.5+delta. *Journal of Physics and Chemistry of Solids* **1998,** *59* (8), 1331- 1336.

35. Zhu, Y. T.; Peterson, E. J.; Baldonado, P. S.; Coulter, J. Y.; Peterson, D. E.; Mueller, F. M., Crystal structure and chemistry of four new RBa4Cu3O8.5+delta (R = Ho, Er, Tm and Yb) compounds. *Journal of Alloys and Compounds* **1998,** *281* (2), 137- 145.

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39. Cooley, J. C.; Hults, W. L.; Peterson, E. J.; Smith, J. L., PrBa2Cu3Ox superconducting powders. *International Journal of Modern Physics B* **1998,** *12* (29-31), 3254-3258.

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45. Findikoglu, A. T.; Arendt, P. N.; Groves, J. R.; Foltyn, S. R.; Peterson, E. J.; Reagor, D. W.; Jia, Q. X., Microwave surface resistance of YBa2Cu3O7-delta films on polycrystalline alumina and Ni-based alloy substrates with ion-beam-assisted-deposited buffer layers. *Ieee Transactions on Applied Superconductivity* **1997,** *7* (2), 1232-1235.

46. Findikoglu, A. T.; Arendt, P. N.; Foltyn, S. R.; Groves, J. R.; Jia, Q. X.; Peterson, E. J.; Bulaevskii, L.; Maley, M. P.; Reagor, D. W., Power-dependent microwave properties of superconducting YBa2Cu3O7-x films on buffered polycrystalline substrates. *Applied Physics Letters* **1997,** *70* (24), 3293-3295.

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59. Salazar, K. V.; Ott, K. C.; Dye, R. C.; Hubbard, K. M.; Peterson, E. J.; Coulter, J. Y.; Kodas, T. T., Aerosol Assisted Chemical Vapor-Deposition of Superconducting YBa2Cu3O7-X. *Physica C* **1992,** *198* (3-4), 303-308.

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62. Muenchausen, R. E.; Foltyn, S. R.; Nogar, N. S.; Estler, R. C.; Peterson, E. J.; Wu, X. D., Laser-Induced Target Modification Effects on Pulsed Laser Depositions of Y- Ba-Cu-O Superconducting Thin-Films. *Nuclear Instruments & Methods in Physics Research Section a-Accelerators Spectrometers Detectors and Associated Equipment* **1991,** *303* (1), 204-207.

63. Foltyn, S. R.; Dye, R. C.; Ott, K. C.; Peterson, E.; Hubbard, K. M.; Hutchinson, W.; Muenchausen, R. E.; Estler, R. C.; Wu, X. D., Target Modification in the Excimer Laser Deposition of YBa2Cu3O7-X Thin-Films. *Applied Physics Letters* **1991,** *59* (5), 594-596.

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CONFERENCE PROCEEDINGS

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2. Datye, A.K., T. Conant, A. Karim, P.D. Burton, H.N. Pham, E. Petersen, V. Lebarbier, B. Halevi, Y. Wang, and L.F. Allard, *Bimetallic PdZn catalysts for the steam reforming of methanol.* Abstracts of Papers of the American Chemical Society, **2009**, 237.

3. Peterson, E. J., Conant., T. R., Burton, P., De La Riva, A. Gabaldon, J. P., Houk, L. R. Pham, H. Lovato, K., Paiz, J., Datye, A. K *D-57 Alumina-Supported Palladium Catalyst Crystallite Size Determination by EXAFS, XRD, AND TEM*. *Denver X-Ray Conference*, Powder Diffraction: **2008**; Vol. 23.

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