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Professional Preparation

Ph.D. in Physics, University of California, Santa Cruz, Dec. 1996

Thesis: [Local structural distortions and disorder in advanced perovskite materials](#)

Advisor: [Prof. Frank Bridges](#)

B.Sc. in Physics, minor in art history, University of California, San Diego, 1989

Research interests

My primary scientific interest is in charge, spin and lattice relationships. This interest has led to studies in colossal magnetoresistance, Kondo interactions, heavy fermions, mixed-valence systems, non-Fermi liquids, and spin-glasses. I am very interested in applying this experience to *f*-electron organometallic molecules that display similar interactions. I have recently applied this experience in disorder and electronic structure to the problem of self-irradiation damage in plutonium intermetallics. Other interests include nuclear environmental and materials science. I am an expert in measuring local crystal and electronic structure with the x-ray-absorption fine-structure (XAFS) technique, including expanding the technique for use in actinides with resonant x-ray emission spectroscopy (RXES). I have experience in pair-distribution function (PDF) and Rietveld analysis of x-ray and neutron diffraction data, and SQUID magnetometry.

Employment

Principal Investigator	Chemical Sciences Division (CSD) The Glenn T. Seaborg Center (GTSC) Lawrence Berkeley National Laboratory (LBNL)	Jan. 2000-present
Staff Scientist	CSD, GTSC, LBNL	Aug. 1999- present
Postdoctoral Associate	UC Irvine and Los Alamos National Laboratory (LANL), stationed at LANL, with Prof. Jon Lawrence and Dr. George Kwei	June 1997-July 1999
Postdoctoral Associate	Lawrence Berkeley National Laboratory with Dr. David K. Shuh	Feb. 1997-May 1997
Research Assistant	UC Santa Cruz with Prof. Frank Bridges	1994-1996
Teaching Assistant	UC Santa Cruz Physics Department	1990-1995
Laboratory Assistant	UC San Diego with Dr. Andrew Buffington	1987-1990

Professional Services

Condensed Matter Physics Session Organizer for *Pu Futures 2014*, Las Vegas, 2014.

Stanford Synchrotron Radiation Laboratory Proposal Review Panel, Member 2013-present.

Co-chair of *Symposium Y*, “*Actinides - Basic science, applications, and technology*,” Materials Research Society Spring Meeting, San Francisco, April 9-13, 2012.

Co-chair of the *SSRL Workshop: Advanced Topics in Analysis and Applications*, SLAC National Accelerator Center, Menlo Park, Oct. 15, 2008.

Divisional Associate Editor for *Physical Review Letters*, 2008-2014

Lawrence Berkeley National Laboratory Library Committee, Member 2005-2010, Chair June 2005-2010, Alternate 2010-present

Chemical Sciences Division representative on the *Lawrence Berkeley National Laboratory Information Technologies Advisory Committee*, June 2003-2013

Chemical Sciences Division representative on the *Lawrence Berkeley National Laboratory Computer Protection and Infrastructure Committee*, July 2001-present

Stanford Synchrotron Radiation Laboratory Users' Executive Committee, Member 1999-2003, Vice-chair in 2001, Chair in 2002, ex-officio 2003.

Co-chair of the *Stanford Synchrotron Radiation Laboratory User Meeting*, Menlo Park, Oct. 2001

Other Community Service

Member, *St. Paul's Episcopal School Board of Trustees* (2012-present), Chair of *Development Committee* (2013-present), *Board* co-Chair (2014-present).

Staff member of *Berkeley Troop 6 Boy Scout Troop*, currently as an Assistant Scoutmaster.

Professional Memberships

American Physical Society

American Chemical Society

Fellowships, Awards, and Honors

Fellow of the American Physical Society (2014)

International Union of Crystallography Young Scientist Award, 2000

California State NFAA Archery Champion, Youth Barebow, 1981

PUBLICATIONS (Note: as of 1/1/15, I have an [h-index](#) of 30 using Web of Science and Google Scholar)
(Most links are to doi.dx.org. Links to my personal website conform to the rules of [self-archiving](#))

- [1] A. Buffington, H. S. Hudson, and C. H. Booth, "A laboratory measurement of CCD photometric and dimensional stability." *Pub. Astr. Soc. Pac.* **652**, 688 (1990). doi: 10.1086/132692
- [2] A. Buffington, C. H. Booth, and H. S. Hudson, "Using image area to control CCD systematic errors in spaceborne photometric and astrometric time-series measurements." *Pub. Astr. Soc. Pac.* **665**, 685 (1991). doi: 10.1086/132868
- [3] C. H. Booth, F. Bridges, J. B. Boyce, T. Claeson, Z. X. Zhao, and P. Cervantes, "Local disorder in the oxygen environment around praseodymium in $Y_{1-x}Pr_xBa_2Cu_3O_7$." *Mat. Rec. Soc. Symp. Proc.* **307**, 117 (1993).
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- [10] G. G. Li, F. Bridges, and C. H. Booth, "XAFS standards: a comparison of experiments and theory." *Phys. Rev. B* **52**, 6332 (1995). doi: 10.1103/PhysRevB.52.6332
- [11] C. H. Booth, F. Bridges, E. D. Bauer, G. G. Li, J. B. Boyce, T. Claeson, C. H. Chu, and Q. Xiong, "XAFS measurements of negatively correlated atomic displacements in $HgBa_2CuO_{4+\delta}$." *Phys. Rev. B (Rapid Comm.)* **52**, R15745 (1995). doi: 10.1103/PhysRevB.52.R15745
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- [137] A. Durand, D. Belanger, T. Hamil, F. Ye, S. Chi, J. Fernandez-Baca, C. H. Booth, Y. Adbollahian, M. Bhat, "The unusual magnetism of nanoparticle LaCoO_3 ." Submitted.
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SOLICITED PRESENTATIONS (does not include local department seminars, etc.)

Materials Research Society (MRS) Meeting. Boston, Massachusetts, Dec. 1997. Talk entitled: Strongly localized holes in CMR $\text{La}_{1-x}\text{Ca}_x\text{MnO}_3$ in the metallic state from resistivity, local structure and μSR measurements.

Stanford Synchrotron Radiation Laboratory User's Meeting, Stanford, California, Oct. 1998. Talk entitled: Pd/Cu site interchange and non-Fermi-liquid behavior in UCu_4Pd .

American Physical Society March Meeting, Atlanta, Georgia, March 1999. Talk entitled: Local structure, hole localization and magnetism in CMR perovskites.

Frontier-Science Research Conference on Magnetic Oxides, La Jolla, California, July 1999. Talk entitled: X-ray absorption studies of the $\text{La}_{1-x}\text{Ca}_x\text{MnO}_3$ series.

International Conference on X-Ray Absorption Fine Structure, XAFS XI, Aiko, Japan, July 2000. Talk entitled: Lattice disorder in strongly-correlated lanthanide and actinide intermetallics.

Physics Department Colloquium, University of Nevada, Las Vegas, November 2, 2001. Talk entitled: Non-Fermi liquid behavior in f -electron intermetallics: new state of matter or cruel joke?

Graduate course lecture for UC Berkeley's "Nuclear and Environmental Chemistry" taught by Prof. H. Nitsche, November 29, 2001. Talk entitled: Principles and fundamentals of x-ray absorption fine structure in actinides.

Physics Department Colloquium, University of California, Davis January 28, 2002. Talk entitled: Non-Fermi liquid behavior in f -electron intermetallics: new state of matter or cruel joke?

Workshop on "Phase Competition in Complex Oxides and Related Compounds", Lawrence Berkeley National Laboratory, May 14-16, 2003. Talk entitled: The role of local disorder in non-Fermi liquid f -electron intermetallics.

Materials Research Society (MRS) Meeting. Boston, Massachusetts, Dec. 2003. Talk entitled: The role of local structural disorder in non-Fermi liquid f -electron intermetallics

At the Frontiers of Condensed Matter II, Buenos Aires, Argentina, June 22-26, 2004. Talk entitled: Lattice disorder and magnetism in selected f -electron intermetallic compounds.

Condensed Matter Seminar, University of California, Santa Cruz, May 13, 2005. Talk entitled: Kondo and the nanoscale: evidence of size effects in intermetallic nanoparticles and organometallic molecules.

The 16th American Conference on Crystal Growth and Epitaxy, Big Sky, Montana, July 11-15, 2005. Talk entitled: Probing the superconducting state with lattice disorder in Ce- and Pu-based 115 compounds.

The International Conference on Strongly Correlated Electron Systems, Vienna, Austria, July 22-26, 2005. Talk entitled: Kondo and the nanoscale: evidence of size effects in intermetallic nanoparticles and organometallic molecules.

The Plutonium Lunch, Lawrence Livermore National Laboratory, Livermore, California, May 2, 2006. Talk entitled: Radiation damage and disorder in superconducting PuCoGa₅: a work in progress.

The George Hsing Kwei Memorial Symposium, Los Alamos, New Mexico, June 27, 2006. Talk entitled: Correlated electrons from intermetallics to organometallics.

Plutonium Futures, Monterey, California, July 9-13, 2006. Talk entitled: Local Structure, Superconductivity and Radiation Damage in PuCoGa₅.

Condensed Matter Seminar, University of California, Irvine, March 14, 2007. Talk entitled: Kondo and the nanoscale: evidence of size effects in intermetallic nanoparticles and organometallic molecules.

Condensed Phase and Interfacial Molecular Science Contractors' Meeting for the Department of Energy's Basic Energy Sciences, Warrenton, Virginia, October 21-24, 2007. Talk entitled: Correlated-electron effects in single molecules.

California High-Pressure Science Observatory Group Meeting, University of California, Berkeley, November 20, 2007. Talk entitled: Correlated-electron effects from heavy-fermions to single molecules

Stanford Synchrotron Radiation Laboratory School on Synchrotron X-ray Absorption Spectroscopy, Stanford Linear Accelerator Center, Menlo Park, California May 20, 2008. Talk entitled: EXAFS in theory: an experimentalist's guide to what it is and how it works.

International Conference on Actinides and X-ray Absorption Spectroscopy, Saint-Aubin, France, July 15-17, 2008. Tank entitled: Probing radiation damage in plutonium alloys, especially the PuCoGa₅ superconductor.

Stanford Synchrotron Radiation Laboratory Users' Meeting EXAFS Workshop, SLAC National Accelerator Laboratory, Menlo Park, California Oct. 15, 2008. Talk entitled: An introduction to some fundamental aspects of EXAFS analysis: Fourier concepts and random errors.

The Pohang Light Source 20th Anniversary Synchrotron Radiation Users' Meeting, Pohang, Korea, Nov. 20-21, 2008. Talk entitled: Correlated electron effects from x-ray absorption fine structure in single molecules.

The Pohang Light Source 20th Anniversary Synchrotron Radiation Users' Meeting, Pohang, Korea, Nov. 20-21, 2008. Talk entitled: EXAFS in theory: an experimentalist's guide to what it is and how it works.

Condensed Matter Seminar, University of California, Davis, Dec. 4, 2008. Talk entitled: Kondo and the nanoscale: Correlated electron effects in intermetallic nanoparticles and organometallic molecules.

Stanford Synchrotron Radiation Laboratory School on Synchrotron X-ray Absorption Spectroscopy Techniques, Stanford Linear Accelerator Center, Menlo Park, California June 2-5, 2009. Talk entitled: EXAFS in theory: an experimentalist's guide to what it is and how it works.

International Conference on Actinides (Actinides 2009), San Francisco, July 12-17, 2009. Talk entitled: A moving target: Responding to magnetic and structural disorder in lanthanide- and actinide-based superconductors.

North American Core Shell Spectroscopy Conference, Denver, August 2-6, 2010. Talk entitled: Intermediate valence in Ce- and Yb-based organometallic molecules elucidated by the x-ray absorption fine-structure technique.

UC Berkeley College of Chemistry Inorganic Seminar, September 10, 2010. Talk entitled: Configuration interaction effects in cerium and ytterbium metallocenes: Kondo-like contributions to bonding in nanoscale systems.

International School & Symposium on Multifunctional Molecule-based Materials, Argonne National Laboratory, March 13-18, 2011. Talk entitled: Correlated-electron effects in lanthanide organometallic molecules

University of Tennessee, Knoxville Physics Colloquium, November 7, 2011. Talk entitled: The localized-delocalized f-orbital boundary in actinide Intermetallics.

Stanford Synchrotron Radiation Laboratory School on Synchrotron X-ray Absorption Spectroscopy Techniques, Stanford Linear Accelerator Center, Menlo Park, California June 28-July 1, 2011. Talk entitled: Advanced EXAFS analysis and considerations: What's under the hood.

Physics and Chemistry of the Heavy Elements Symposium, Santa Fe, June 20-22, 2012. Talk entitled: Strong correlations as multiconfigurational f-orbital states: From lanthanide organometallics to actinide Intermetallics.

Condensed Matter and Materials Division Seminar, Lawrence Livermore National Laboratory, Oct. 17, 2012. Talk entitled: Progress toward understanding fundamental aspects of plutonium: Multiconfigurational ground states and self-irradiation damage

American Physical Society March Meeting, Baltimore, MD, March 18-22, 2013. Talk entitled: Multiconfigurational nature of 5f orbitals in uranium and plutonium and their intermetallic compounds

American Chemical Society Meeting: Symposium in Honor of Richard G. Haire, New Orleans, LA, April 7-12, 2013. Talk entitled: Multiconfigurational nature of 5f orbitals in uranium and plutonium and their intermetallic compounds.

Advanced Photon Source Users Meeting, Argonne National Laboratory, May 6-9, 2013. Talk entitled: Multiconfigurational nature of 5f orbitals in uranium and plutonium and their intermetallic compounds

Stanford Synchrotron Radiation Laboratory School on Synchrotron X-ray Absorption Spectroscopy Techniques, Stanford Linear Accelerator Center, Menlo Park, California June 10-14, 2013. Talk entitled: Statistical analysis of EXAFS data fitting.

International Conference on Actinides, Karlsruhe, Germany, July 21-26, 2013. Talk entitled: Multiconfigurational nature of 5f orbitals in uranium and plutonium and their intermetallic compounds.

Actinide XAS 2014, the 7th Workshop on Speciation, Techniques, and Facilities for Radioactive Materials at Synchrotron Light Sources, Schloss, Böttstein, Switzerland, May 20-22, 2014. Talk entitled: Delocalization and occupancy effects of 5f orbitals in plutonium (and uranium!) intermetallics using L₃-edge resonant x-ray emission spectroscopy.