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EDUCATION

- 1990 **Ph.D.**, Physical Chemistry, University of California Los Angeles, CA USA
Advisor: Professor R. Stanley Williams
- 1987 **M.S.**, Physical Chemistry, University of California Los Angeles, CA USA
- 1983 **B.S.**, Chemistry, University of California Riverside, CA USA

EXPERIENCE

- 2013 **Senior Scientist and Principal Investigator,
Director, The Glenn T. Seaborg Center (GTSC);**
Actinide Chemistry Group (Group Leader), Chemical Sciences Division
The Glenn T. Seaborg Center, Lawrence Berkeley National Laboratory
- 2013-2011 **Senior Scientist and Principal Investigator
Director, The Glenn T. Seaborg Center (GTSC); Director, Molecular
Environmental Sciences (MES) Beamline 11.0.2 at the Advanced Light Source**
Actinide Chemistry Group (Group Leader), Chemical Sciences Division
The Glenn T. Seaborg Center, Lawrence Berkeley National Laboratory
- 2010-2007 **Senior Scientist and Principal Investigator
Associate Director, GTSC; Leader, ALS-MES Beamline 11.0.2**
Actinide Chemistry Group, Chemical Sciences Division
The Glenn T. Seaborg Center, Lawrence Berkeley National Laboratory
- 2007-2005 **Senior Staff Scientist and Principal Investigator
Associate Director, GTSC; Project Leader, ALS-MES Beamline 11.0.2**
Actinide Chemistry Group, Chemical Sciences Division
The Glenn T. Seaborg Center, Lawrence Berkeley National Laboratory
- 2004-2000 **Senior Staff Scientist and Principal Investigator
Project Leader, ALS-MES Beamline 11.0.2**
Actinide Chemistry Group, Chemical Sciences Division
The Glenn T. Seaborg Center, Lawrence Berkeley National Laboratory
- 2000-1999 **Staff Scientist and Principal Investigator
Project Leader, ALS-MES Beamline 11.0.2**
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- 1999-1997 **Staff Scientist and Principal Investigator**

- Project Leader, ALS-MES Beamline 11.0.2**
Actinide Chemistry Group, Chemical Sciences Division
Lawrence Berkeley National Laboratory
- 1997-1992 **Staff Scientist and Principal Investigator**
Actinide Chemistry Group, Chemical Sciences Division
Lawrence Berkeley National Laboratory
- 1992-1990 **Postdoctoral Fellow**
Surface chemistry/physics in collaboration with IBM Yorktown Heights at the
National Synchrotron Light Source (NSLS), Brookhaven, NY
Department of Physics, University of California Riverside, Riverside, CA
- 1990-1986 **Research Assistant**
Department of Chemistry and Biochemistry, University of California Los Angeles
- 1988 **Visiting Scientist**
Laboratory for Quantum Materials, RIKEN, Wako-shi, Saitama, Japan
- 1986-1984 **Teaching Assistant**
Department of Chemistry and Biochemistry, University of California Los Angeles
- 1984-1982 **Touring Tennis Professional**
Association of Touring Professionals (ATP), world-ranked 1983-84, Los Gatos, CA
- 1982-1981 **Research Assistant**
Department of Chemistry, University of California Riverside, Riverside, CA
- 1980 **Research Assistant**
SmithKline Incorporated, Santa Clara, CA.

AWARDS AND HONORS:

- 2012 Director's Award for Exceptional Achievement (Safety), LBNL
2010 Professor T. J. Delbaere Memorial Award 2010, Canadian Light Source
2008 Inaugural Richard G. Haire Lecture, Chemistry Dept., Auburn University
2007 City of Riverside Sports Hall of Fame, Riverside, CA
2003 Tennis Hall of Fame, Inaugural Inductee, University of California Riverside
2002 Outstanding Performance Award, Lawrence Berkeley National Laboratory
1997 Outstanding Performance Award, Lawrence Berkeley National Laboratory
1989 Athletic Hall of Fame, Inductee No. 8, University of California Riverside
1985-1984 Du Pont Excellence in Teaching Award, University of California Los Angeles
1982-1979 NCAA All-America Tennis Team, University of California Riverside

PROFESSIONAL AFFILIATIONS:

American Chemical Society (ACS), American Physical Society (APS)
American Vacuum Society (AVS), Materials Research Society (MRS)
American Association for the Advancement of Science (AAAS)

PUBLICATIONS

1. J. H. Huang, R. S. Daley, D. K. Shuh, and R. S. Williams, "Surface Structure of Epitaxial NiSi₂ Grown on Si(001) Determined by Low Energy Ion Scattering Techniques," *Surf. Sci.* **186**, 115-137 (1987).
2. R. S. Williams, D. K. Shuh, and Y. Segawa, "Growth and Luminescence Spectroscopy of a CuCl Quantum Well Structure," *J. Vac. Sci. Technol. A* **6**, 1950-1952 (1988).
3. D. K. Shuh and R. S. Williams, "Summary Abstract: Ternary Solid Phase Equilibria in the Systems (Ag, In, Au)-(Cd,Hg)-Te," *J. Vac. Sci. Technol. A* **6**, 1564 (1988).
4. L. Vogel-Kopletz, D. K. Shuh, Y.-J. Chen, R. S. Williams and J. I. Zink, "Laser-Assisted Photodeposition of Platinum at Atmospheric Pressure and Room Temperature from CpPt(CH₃)₃," *Appl. Phys. Lett.* **53**, 1705-1707 (1988).
5. H. D. Kaesz, R. S. Williams, R. F. Hicks, Y.-J. Chen, Z. Xue, D. Xu, and D. K. Shuh, "Low Temperature Vapor Deposition of Transition Metal Thin Films From Volatile Hydrocarbon Complexes," *Mater. Res. Soc. Symp. Proc.* **131**, 395-400 (1988).
6. D. K. Shuh, Y. K. Kim and R. S. Williams, "Shop Note: A Bolt-on Deposition Source for Ultra-High Vacuum Growth of Compound Intermetallic Films," *J. Vac. Sci. Technol.* **A7**, 2813-2814 (1989).
7. L. P. Sadwick, D. K. Shuh, Y. K. Kim, K. L. Wang, and R. S. Williams, "Thermodynamically Stable Conducting Films of Intermetallic PtGa₂ on GaAs," *Mater. Res. Soc. Symp. Proc.* **144**, 595-600 (1989).
8. Y. K. Kim, D. K. Shuh, R. S. Williams, L. P. Sadwick, and K. L. Wang, "A Study of Thermodynamic Phase Stability of Intermetallic Thin Films of Pt₂, PtGa, and PtGa₂ on GaAs," *Mater. Res. Soc. Symp. Proc.* **148**, 14-20 (1989).
9. Z. Xue, M. J. Strouse, D. K. Shuh, H. D. Kaesz, R. F. Hicks, and R. S. Williams, "Characterization and Low Temperature Organometallic Chemical Vapor Deposition of (methylcyclopentadienyl)platinumtrimethyl," *J. Amer. Chem. Soc.* **111**, 8779-8784 (1989).
10. H. D. Kaesz, R. S. Williams, R. F. Hicks, J. I. Zink, Y. J. Chen, H. J. Muller, Z. Xue, D. Q. Xu, D. K. Shuh, and Y. K. Kim, "Deposition of Transition Metal Thin Films From Organometallic Precursors," *New J. Chem.* **14**, 527-534 (1990).
11. M. Z. Martin, D. K. Shuh, R. S. Williams, and R. Ostrum, "Transport Properties and Infrared Spectra of CuCl Thin Films," *J. Appl. Phys.* **67**, 3097-3101 (1990).
12. Y. K. Kim, D. A. Baugh, D. K. Shuh, R. S. Williams, L. P. Sadwick, K. L. Wang, "Structural and Chemical Stability of Thin Films of Pt-Ga Intermetallic Compounds on GaAs(001)," *J. Mater. Res.* **5**, 2139-2151 (1990).
13. D. K. Shuh, R. M. Charatan, R. S. Daley, and R. S. Williams, "Growth and Reactivity of CuCl on Si(111)," *Chem. Mater.* **2**, 492-494 (1990).
14. S. Den, Y. Segawa, J.-I. Kusano, Y. Aoyagi, S. Namba, D. K. Shuh, and R. S. Williams, "Growth of CuCl Quantum Wells by the MBE Method," (in Proceedings of the Japanese Physical Society, *Jap. J. Appl. Phys.* (1990).
15. C. W. Lo, D. K. Shuh, V. Chakarian, K. A. German, and J. A. Yarmoff, "Synchrotron Radiation Studies of the XeF₂ Etching of Silicon," in *Proceedings of the Conference on Dry Processing*, Tokyo, Japan, November, (1990).
16. L. J. Terminello, D. K. Shuh, D. A. Lapiano-Smith, F. J. Himpsel, J. Stöhr, D. S. Bethune, and G. Meijer, "Unfilled Orbitals of C₆₀ and C₇₀ From Carbon K-shell X-ray Absorption Fine Structure," *Chem. Phys. Lett.* **182**, 491-496 (1991).

17. D. K. Shuh, R. S. Williams, Y. Segawa, J.-I. Kusano, Y. Aoyagi, and S. Namba, "Line-Shape and Lifetime Studies of Exciton Luminescence From Confined CuCl Thin Films," *Phys. Rev. B* **44**, 5827-5833 (1991).
18. E. A. Eklund, P. D. Kirchner, D. K. Shuh, F. R. McFeely, and E. Cartier, "Direct Determination of Impact-Ionization Rates Near Threshold in Semiconductors Using Soft X-ray Photoemission," *Phys. Rev. Lett.* **68**, 831-833 (1992).
19. A. Santoni, L. Sorba, D. K. Shuh, L. J. Terminello, A. Franciosi, and S. Nannarone, "Initial Stages of Atomic Hydrogen Chemisorption on GaAs(110): A High Resolution Photoemission Study," *Surf. Sci.* **270**, 893-901 (1992).
20. S. A. Joyce, C. Clark, V. Chakarian, D. K. Shuh, J. A. Yarmoff, T. E. Madey, P. Nordlander, B. Maschoff, and T. Hui-Shu, "The Influence of Coadsorbed Potassium on the Electron Stimulated Desorption of F⁺, F⁻, and F* From PF₃ on Ru(0001)," *Phys. Rev. B* **45**, 14264-14272 (1992).
21. J. A. Yarmoff, D. K. Shuh, T. D. Durbin, C. W. Lo, D. A. Lapiano Smith, F. J. Himpsel, and F. R. McFeely, "Atomic Layer Epitaxy of Silicon by Dichlorosilane Studied With Core Level Spectroscopy," *J. Vac. Sci. Technol. A* **10**, 2303-2307 (1992).
22. E. A. Eklund, P. D. Kirchner, D. K. Shuh, F. R. McFeely, and E. Cartier, "Direct Determination of Impact-Ionization Rates Near Threshold in Al_{0.9}Ga_{0.1}As and GaAs Using Molecular-Beam Epitaxially Grown GaAs/Al_{0.9}Ga_{0.1}As and Soft X-ray Photoemission," *J. Vac. Sci. Technol. B* **10**, 2046-2050 (1992).
23. S. V. Didziulis, J. R. Lince, D. K. Shuh, T. D. Durbin, and J. A. Yarmoff, "Photoelectron Spectroscopy of MoS₂ at the Sulfur 2p Absorption Edge," *J. Electron Spectros. Rel. Phenom.* **60**, 175-192 (1992).
24. J. A. Yarmoff, D. K. Shuh, V. Chakarian, T. D. Durbin, K. A. H. German and C. W. Lo, "Photon Stimulated Desorption of Fluorine from Semiconductor Surfaces," in *Desorption Induced by Electronic Transitions DIET-V*, edited by A. R. Burns, E. B. Stechel, and D. R. Jennison (Springer-Verlag, Berlin, 1993), pp. 253-258.
25. T. E. Madey, H.-S. Tao, L. Nair, U. Diebold, S. M. Shivaprasad, A. L. Johnson, A. Poradzisz, N. D. Shinn, J. A. Yarmoff, V. Chakarian and D. K. Shuh, "Structure and Kinetics of Electron Beam Damage in a Chemisorbed Monolayer: PF₃ on Ru(0001)," in *Desorption Induced by Electronic Transitions DIET-V*, edited by A. R. Burns, E. B. Stechel, and D. R. Jennison (Springer-Verlag, Berlin, 1993), pp. 182-188.
26. J. R. Lince, S. V. Didziulis, D. K. Shuh, T. D. Durbin, and J. A. Yarmoff, "Interaction of O₂ With the Fe_{0.84}Cr_{0.16} (001) Surface Studied by Photoelectron Spectroscopy," *Surf. Sci.* **277**, 43-63 (1992).
27. C. W. Lo, P. R. Varekamp, D. K. Shuh, T. D. Durbin, V. Chakarian, and J. A. Yarmoff, "Substrate Disorder Induced by a Surface Chemical Reaction: The Fluorine Silicon Interaction," *Surf. Sci.* **292**, 171-181 (1993).
28. C. W. Lo, D. K. Shuh, V. Chakarian, T. D. Durbin, P. R. Varekamp, and J. A. Yarmoff, XeF₂ Etching of Si(111): The Geometric Structure of the Reaction Layer," *Phys. Rev. B* **47**, 15648-15659 (1993).
29. C. W. Lo, D. K. Shuh, and J. A. Yarmoff, "The Influence of Electronic Structure on XeF₂ Etching of Silicon," *J. Vac. Sci. Technol. A* **11**, 2054-2058 (1993).
30. D. K. Shuh, L. J. Terminello, L. A. Boatner, and M. M. Abraham, "X-ray Absorption Spectroscopy of the Rare Earth Orthophosphates," *Mater. Res. Soc. Symp. Proc.* **307**, 95-100 (1993). LBNL-34477

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33. V. Chakarian, D. K. Shuh, J. A. Yarmoff, Hui-Shu Tao, U. Diebold, B. Maschoff, N. D. Shinn, and T. E. Madey, "The Influence of Pre-adsorbed K on the Adsorption of PF₃ on Ru(0001) Studied by Soft X-ray Photoelectron Spectroscopy," *J. Chem. Phys.* **100**, 5301-5313 (1994). LBNL-35202
34. V. Chakarian, D. K. Shuh, Jory A. Yarmoff, C. M. Håkansson, and U. O. Karlsson, "The Adsorption of Iodine on Si(111) 7x7 Studied by Soft X-ray Photoemission," *Surf. Sci.* **296**, 383-392 (1994).
35. T. D. Durbin, J. R. Lince, S. V. Didziulis, D. K. Shuh, and J. A. Yarmoff, "Soft X-ray Photoelectron Spectroscopy Study of the Interaction of Cr with MoS₂(0001) Surface," *Surf. Sci.* **302**, 314-328 (1994).
36. P. R. Varekamp, W. C. Simpson, D. K. Shuh, T. D. Durbin, V. Chakarian, and J. A. Yarmoff, "Studies of the Electronic Structure of GaF₃ Films Grown on GaAs via Exposure to XeF₂," *Phys. Rev. B* **50**, 14267-14276 (1994). LBNL-36301
37. T. D. Durbin, W. C. Simpson, V. Chakarian, D. K. Shuh, and J. A. Yarmoff, "Stimulated Desorption of Cl⁺ and the Chemisorption of Cl₂ on Si(111)-7x7 and Si(100)-2x1," *Surf. Sci.* **316**, 257-266 (1994).
38. I. Almahamid, J. J. Bucher, J. C. Bryan, S. B. Clark, N. M. Edelstein, E. A. Hudson, N. Kaltsoyannis, H. Nitsche, T. Reich, P. Torretto, W. Lukens, K. Roberts, and D. K. Shuh, "Electronic and Structural Investigations of Technetium Compounds by XAS," *Inorg. Chem.* **34**, 193-198 (1995). LBNL-36432
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44. W. C. Simpson, P. R. Varekamp, D. K. Shuh, and J. A. Yarmoff, "A Soft X-ray Photoelectron Spectroscopy Study of XeF₂ with GaAs," *J. Vac. Sci. Technol. A* **13**, 1709-1713 (1995).
45. J. A. Yarmoff, V. Chakarian, T. D. Durbin, C. W. Lo, D. K. Shuh, W. C. Simpson, and P. R. Varekamp, "Photon Stimulated Desorption of Halogens," *Nucl. Instrum. and Meth. B* **101**, 60-63 (1995).
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47. P. G. Allen, J. J. Bucher, D. L. Clark, N. M. Edelstein, S. A. Eckberg, J. W. Ghodes, E. A. Hudson, N. Kaltsoyannis, W. W. Lukens, M. P. Neu, P. D. Palmer, T. Reich, D. K. Shuh, C. D. Tait, and B. D. Zwick, "Multinuclear NMR, Raman, EXAFS, and X-ray Diffraction Studies of Uranyl Carbonate Complexes in Near-neutral Aqueous Solution. X-ray Structure of [C(NH₂)₃]₆[(UO₂)₃(CO₃)₆]·6.5H₂O," *Inorg. Chem.* **34**, 4797-4807 (1995). LBNL-36676
48. P. R. Varekamp, C. M. Håkansson, D. K. Shuh, J. Kanski, U. O. Karlson, and J. A. Yarmoff, "A Synchrotron Photoemission Study of the Reaction of Iodine With GaAs(001)," *Vacuum* **46**, 1231-1232 (1995).
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52. W. C. Simpson, W. M. Tong, C. B. Weare, D. K. Shuh, and J. A. Yarmoff, "The Temperature Dependence of the Cl₂/GaAs(110) Surface Product Distribution," *J. Chem. Phys.* **104**, 320-325 (1996). LBNL-41218
53. P. G. Allen, D. K. Shuh, J. J. Bucher, N. M. Edelstein, T. Reich, M. A. Denecke, and H. Nitsche, "EXAFS Determination of Uranium Structures: Uranyl Complexed with Tartaric, Citric, and Malic Acids," *Inorg. Chem.* **35**, 784-787 (1996). LBNL-37154
54. D. M. Gruen, A. R. Krauss, C. D. Zuiker, R. Csencsits, L. J. Terminello, J. A. Carlisle, I. Jimenez, and D. G. J. Sutherland, D. K. Shuh, W. Tong, and F. J. Himpsel, "Characterization of Nanocrystalline Diamond Films by Core-level Photoabsorption," *Appl. Phys. Lett.* **68**, 1640-1642 (1996). LBNL-41219
55. I. Jimenez, A. Jankowski, L. J. Terminello, G. L. Doll, J. V. Mantese, W. M. Tong, D. K. Shuh, J. A. Carlisle, D. G. J. Sutherland, and F. J. Himpsel, "Near-edge X-ray Absorption Fine Structure Study of Bonding Modifications in BN Thin Films by Ion Implantation," *Appl. Phys. Lett.* **68**, 2816-2818 (1996). LBNL-41220
56. D. G. J. Sutherland, H. P. Elliker, G. Fox, T. W. Hagler, H. W. Lee, K. Pakbaz, S. C. Williams, T. A. Callcott, J. A. Carlisle, D. L. Ederer, F. J. Himpsel, J. J. Jia, I. Jimenez, R. C. C. Perera, D. K. Shuh, and W. M. Tong, "Photo-oxidation of Electroluminescent Polymers Studied by Core-level Photoabsorption Spectroscopy," *Appl. Phys. Lett.* **68**, 2046-2048 (1996). LBNL-41221

57. T. Reich, M. A. Denecke, S. Pompe, H. Nitsche, P. G. Allen, J. J. Bucher, N. M. Edelstein, and D. K. Shuh, "Characterization of Uranyl Ions with Humic Acids by X-ray Absorption Spectroscopy," *Synchrotron Radiation Techniques in Industrial, Chemical, and Materials Science*, K. L. D'Amico, L. J. Terminello, and D. K. Shuh, Eds., Plenum Press, New York (1996), pp. 215-228. LBNL-38368
58. F. J. Himpsel, D. A. Lapiano-Smith, H. Akatsu, J. A. Carlisle, E. A. Hudson, L. J. Terminello, T. A. Callcott, J. J. Jia, M. G. Samant, J. Stöhr, D. L. Ederer, R. C. C. Perera, and D. K. Shuh, "Surface Physics with Synchrotron Radiation," *Synchrotron Radiation Techniques in Industrial, Chemical, and Materials Science*, K. L. D'Amico, L. J. Terminello, and D. K. Shuh, Eds., Plenum Press, New York (1996), pp. 107-118. LBNL-41222
59. L. R. Morss, M. Schmidt, K. L. Nash, P. G. Allen, J. J. Bucher, N. M. Edelstein, and D. K. Shuh, "Spectroscopic Studies of Lanthanide Coordination in Crystalline and Amorphous Phosphates," *Synchrotron Radiation Techniques in Industrial, Chemical, and Materials Science*, K. L. D'Amico, L. J. Terminello, and D. K. Shuh, Eds., Plenum Press, New York (1996), pp. 229-235. LBNL-38369
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