

Brent Fultz

Professor of Materials Science and Applied Physics
California Institute of Technology

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Birth:

Feb. 24, 1955, Troy, New York

Citizenship:

United States of America

Education:

High school graduation, valedictorian, 1972
B.Sc. Physics, Massachusetts Institute of Technology, 1975
M.Sc. Engineering Science, University of California, Berkeley, 1978
Thesis: A Mössbauer Spectrometry Study of Austenite Stability and Impact Fracture in Fe-6Ni Steel
Ph.D. Engineering Science, University of California, Berkeley, 1982
Thesis: A Mössbauer Spectrometry Study of Fe-Ni-X Alloys
Solute-induced perturbations of the ^{57}Fe hyperfine magnetic field in Fe-Ni and Fe-Ni-X were systematized and explained with a magnetic response model. These systematics were then used to measure solute partitioning to retained austenite in Fe-Ni-X alloys and commercial 9Ni steel.

Employment:

- 6/74-9/74 Engineering Aide, General Electric Co., Nuclear Energy
6/75-9/75 Division, Gas Technology Development, Pleasanton, Calif.
- 2/76-9/82 Graduate Student Research Assistant, Lawrence Berkeley
Laboratory, and Univ. of Calif., Berkeley, Calif.
Continuous employment except:
- 9/78-12/78 Teaching Assistant, Univ. of Calif., Berkeley
- 9/79-12/79
- 9/82-12/82 Postdoctoral Fellow, Materials and Molecular Research Division,
Lawrence Berkeley Laboratory
- 12/82-10/85 Staff Scientist II, Materials and Molecular Research Division,
Lawrence Berkeley Laboratory
- 10/85-12/90 Assistant Professor of Materials Science,
California Institute of Technology
- 1/91-3/97 Associate Professor of Materials Science,
California Institute of Technology
- 5/92-9/92 Contract Professor, Faculty of Engineering,
Università degli Studi di Udine, Italy
- 3/97-1/03 Professor of Materials Science,
California Institute of Technology
- 2/03- Professor of Materials Science and Applied Physics,
California Institute of Technology

Consulting:

- 2/86 - 4/97 Materials Science and Engineering Consultant
Everett Charles Technologies
700 E. Harrison Avenue
Pomona, Calif. 91767
- 1/94 - 12/95 Defense Science Study Group
Institute for Defense Analyses
1801 N. Beauregard St.
Alexandria, VA 22311-1772
- 3/96 - 10/96 Defense Science Board
Task Force on Tactics and Technology for 21st Century Military
Superiority, sponsored by the Chairman of the Joint Chiefs of Staff
and the Under Secretary of Defense (Acquisition and Technology).
T. Gold and D. Latham, co-chairs.
- 6/97 - Los Alamos National Laboratory
Inelastic neutron scattering studies of lanthanide and actinide
metals

- 7/97 - Los Alamos Neutron Science Center (LANSCE) Materials Program Advisory Committee (beamtime proposal evaluations for inelastic scattering experiments)
- 11/97 - 1/08 Intense Pulsed Neutron Source (IPNS) Program Advisory Committee (beamtime proposal evaluations for inelastic scattering experiments)
- 10/99 External Reviewer, DOE Chemical Sciences Review of Electrochemical Energy Storage and Conversion Programs, Argonne National Laboratory, Argonne, IL.
- 10/00 Workshop on Advanced Technologies and Urban Operations, Institute for Defense Analyses, Nov. 2000
- 11/00 - 7/01 Actium Materials, Inc. Houston, TX, Scientific Advisory Board Member
- 9/01 Reviewer of Materials Science and Engineering Program, Sandia National Labs., Livermore California (DOE Office of Science).
- 11/01 Instruments Subcommittee, DOE Office of Science Review of the Spallation Neutron Source, Oak Ridge, TN (D. Lehman, Chair).
- 10/15-10/24/02 Reviewer of Neutron Sources (IPNS at Argonne, and Lujan Center at Los Alamos). DOE Office of Science Peer Review.
- 6/2/03-6/4/03 Reviewer of Materials Science Division, Argonne National Laboratory. DOE Office of Science Peer Review.
- 12/03-1/04 Member of Planck Sorption Cooler Lifetime Tiger Team, Jet Propulsion Laboratory.
- 1/28/04 Workshop participant: The Future of Inelastic Scattering at IPNS, Argonne National Lab.
- 12/04 Chair of Advisory Committee Review of the High Flux Isotope Reactor/Center for Neutron Scattering, Oak Ridge, TN.
- 12/31-2/1/05 Reviewer of diffraction and high-pressure beamlines at the National Synchrotron Light Source (NSLS) for the Scientific Advisory Committee of the NSLS.
- 3/24/05 Reviewer of Materials Science and Engineering Program, Sandia National Labs., Livermore California (DOE Office of Science).
- 2/06 Member of review committee for Lehman Review of ESnet at Lawrence Berkeley National Lab. (DOE Office of Science).
- 5/06 Reviewer of High Flux Isotope Reactor/Center for Neutron Scattering, Oak Ridge, TN. DOE Office of Science Peer Review.
- 4/07 Basic Energy Sciences Advisory Committee (BESAC) Committee of Visitors to review the management processes for light sources

- and accelerators, for the Scientific User Facilities Division of Basic Energy Sciences, DOE.
- 12/07 Reviewer of Advanced Photon Source, Argonne Illinois. DOE Office of Science Peer Review.
- 1/08 Chair of the User Advisory Committee of sector 3-ID at the Advanced Photon Source

Administrative Committees:

- Academic Affairs Committee, Department of Materials Science and Mineral Engineering, University of California, Berkeley, Student Representative, 1977-78
- Safety and Laboratory Standards Committee, Materials and Molecular Research Division, Lawrence Berkeley Laboratory, 1977-85
- Materials Science Faculty Search Committee, California Institute of Technology, 1987-88
- Graduate Study Committee, California Institute of Technology, 1988-
- Option Representative for Materials Science, California Institute of Technology, 1988-
- Materials Science Faculty Search Committee, California Institute of Technology, 1991-94
- Option Representative for Engineering and Applied Science (undergraduate program), California Institute of Technology, 1998-2000
- Academic Policies Committee, California Institute of Technology, 1999-2003. Acting Chair 2002-3.

Professional Societies and Service:

- Membership: The Minerals, Metals, and Materials Society (TMS)
 American Physical Society (APS)
 Materials Research Society (MRS)
 The Electrochemical Society
 American Crystallographic Association (ACA)
- Committees: Metals Properties Council (sponsored by ASM, AWS, ASME, ASTM)
 Task Group on Properties of Materials at Cryogenic Temperatures
 1982-1984
- Chemistry and Physics of Materials Committee
 The Minerals, Metals, and Materials Society (TMS) 1987-
Vice-Chairman, 1995 - 96

Chairman, 1997 - 1998

Publications Coordinating Committee
The Minerals, Metals, and Materials Society 1993 - 1996

Divisional Council of the Electronic, Magnetic, and Photonic
Materials Division (EMPMD) of the
The Minerals, Metals, and Materials Society 1994 - 1998

Atomic Transport Committee, ASM International, 1989-
Vice-Chairman, 1992-94
Chairman, 1994 - 97

Divisional Council of the Materials Science Division (MSD) of the
American Society for Metals 1994 - 97

Synchrotron Radiation Instrumentation Collaborative Access Team
Advanced Photon Source, Mössbauer beamline, Argonne, Illinois
1994 – 2002

Los Alamos Neutron Science Center (LANSCE) Users' Group (LUG)
Executive Committee, Neutron Scattering Representative, 2001-2002

U.S. Representative (one of two) on the International Board for the
Applications of the Mössbauer Effect
1999 – 2005

Neutron Scattering Society of America
Member of Executive Committee
2006-2009

College of Reviewers for Canada Research Chairs
2009-

Awards and Honors:

Associate Member, Society of Sigma Xi, 1975

Travel Fellowship for the 5th University Glass Conference, Rensselaer
Polytechnic Institute, Aug., 1979

Scholastic Achievement Award, Golden Gate Chapter of the American
Society for Metals, 1979

John E. Dorn Achievement Award, Golden Gate Chapter of the American
Society for Metals, 1981

IBM Faculty Development Award, 1986, 1987

Xerox Foundation Grant, 1986

Jacob Wallenberg Foundation Scholarship, 1988

Presidential Young Investigator Award, 1988-93

TMS Student Paper Award (supervised Lawrence Anthony,

awardee in both 1988 and 1989)

Patents:

B. Fultz, "Radiation Detector", U.S. Patent # 4,393,306.
Patent rights licensed to Ranger Scientific, Inc.

Ratnakumar V. Bugga, Gerald Halpert, Brent Fultz, Charles Witham, Robert C. Bowman, Jr. and Adrian Hightower
"Metal Hydrides as Electrode/Catalyst Materials for Oxygen Evolution/Reduction in Electrochemical Devices",
U.S. patent No. 5,656,388 issued Aug. 12, 1997.

Ratnakumar V. Bugga, Brent Fultz, Robert C. Bowman, Jr., Subbarao Surampudi, Charles Witham, and Adrian Hightower,
"LaNi₅-Based Metal Hydride Electrode in Ni-MH Rechargeable Cells"
U.S. Patent No. 5,888,665 issued March 30, 1999.

I. E. Anderson, T. W. Ellis, R. C. Bowman, Jr. C. Witham, B. Fultz, and B. V. Ratnakumar, "Ultrafine Hydrogen Storage Powders"
U.S. Patent No. 6,074,453 issued June 13, 2000.

J. Graetz, B. Fultz, C. C. Ahn, and R. Yazami, "High Capacity Li Alloys of Nanophase Si", patent application #20040126659 originally filed 9/10/03, serial # 660382.

J. Graetz, B. Fultz, C. C. Ahn, R. Yazami, and B. Fultz, "High Capacity Li Alloys nanostructured Germanium and Silicon-Germanium of Nanophase Si", Serial Number: 10/829,598; filed on April 22, 2004.

A. Dailly, C. C. Ahn, R. Yazami and B. Fultz, "Methods for Purifying Carbon Materials" U.S. Patent No. 7,537,682 issued May 26, 2009.

Y. Reynier, R. Yazami and B. Fultz, "Electrochemical Thermodynamic Measurement System", patent application filed on August 3, 2006.

Textbook

1. Brent Fultz and James M. Howe, Transmission Electron Microscopy and Diffractometry of Materials, (Springer-Verlag, Heidelberg 2001). ISBN 3-540-67841-7. Drafts used as course text since 1991.
See reviews: Ray Egerton, Micron, in press (2002).
John Hutchison, J. Microscopy 204 (2001) 263-264.
2. Brent Fultz and James M. Howe, Transmission Electron Microscopy and Diffractometry of Materials Second Edition, (Springer-Verlag, Heidelberg 2002). ISBN: 3-540-43764-9. Third printing 2005. Fourth printing 2006.
3. Brent Fultz and James M. Howe, Transmission Electron Microscopy and Diffractometry of Materials Third Edition, (Springer-Verlag, Heidelberg 2007). ISBN: 978-3-540-73885-5. Fifth printing 2007. Translation into

Russian by Technosphaera in 2008. Sixth printing (corrected third edition) 2009.

4. Brent Fultz and James M. Howe, Worked Solutions to Problems in Transmission Electron Microscopy and Diffractometry of Materials. Restricted access web site. As of Jan. 2, 2001 it contains 136 worked solutions to 111 problems out of the 151 in the text.

Books Edited:

5. M. M. Disko, C. C. Ahn, and B. Fultz, eds., Transmission Electron Energy Loss Spectrometry in Materials Science, TMS EMPMD Monograph Series Vol. 2 (TMS, Warrendale, 1992) ISBN Number 0-87339-180-2.
(see glowing review in MSA Bulletin, 1995)
6. B. Fultz, R. W. Cahn, and D. Gupta, eds., Diffusion in Ordered Alloys, TMS EMPMD Monograph Series Vol. 3 (TMS, Warrendale, 1993) ISBN Number 0-87339-204-3.
7. L.Q. Chen, B. Fultz, J. W. Cahn, J. R. Manning, J. E. Morral and J. Simmons, eds., Mathematics of Microstructure Evolution, joint publication of (TMS, Warrendale, PA) TMS ISBN No. 0-87339-351-1 and (SIAM, Philadelphia, PA) SIAM ISBN No. 0-89871-386-2.
8. E. Ma, B. Fultz, R. Shull, J. Morral, and P Nash, eds., Chemistry and Physics of Nanocrystalline and Related Non-Equilibrium Materials, (TMS, Warrendale) (TMS, Warrendale, PA, 1997), ISBN No. 0-87339-358-8.
9. B. Fultz, "Nuclear and Electron Resonance Spectroscopies in Materials Research", Volume 9 in Methods in Materials Research: A Current Protocols Publication. Elton Kaufmann, et al., eds. (John Wiley, New York, 2000). ISBN 0-471-18531-0.
10. B. Fultz, "Electron Methods in Materials Research", Volume 11 in Methods in Materials Research: A Current Protocols Publication. Elton Kaufmann, et al., eds. (John Wiley, New York, 2000). ISBN 0-471-18531-0.

Book Chapter (royalties)

11. Brent Fultz, "Chemical Systematics of Iron-57 Hyperfine Magnetic Field Distributions in Iron Alloys", Chapter 1 in Mössbauer Spectroscopy Applied to Magnetism and Materials Science Vol. I, G. J. Long and Fernande Grandjean, eds., (Plenum Press, New York, 1993) pp. 1-31.
12. Brent Fultz, "Vibrational Entropy and Local Structures of Solids", in Local Structure from Diffraction, S. J. L. Billinge and M. F. Thorpe, eds. (Fundamental Materials Research Series, Plenum Press, New York, 1998) 273-294.

13. Brent Fultz, "Mössbauer Spectrometry", in Methods in Materials Research: A Current Protocols Publication. Elton Kaufmann (Ed. in Chief), edited by B. Fultz, et al. (John Wiley, New York, 2000) Unit 9.c.1.
14. James M. Howe and Brent T. Fultz, "Transmission Electron Microscopy", in Methods in Materials Research: A Current Protocols Publication. Elton Kaufmann (Ed. in Chief), edited by B. Fultz, et al. (John Wiley, New York, 2000) John Wiley, Unit 11a.2.
15. Brent Fultz "Introduction" in Transmission Electron Energy Loss Spectrometry in Materials Science and the EELS Atlas Second Edition, edited by C. C. Ahn (Wiley-VCH, Weinheim, 2004) Chapter 1 pp. 1-20.
16. J.K. Okamoto, D.H. Pearson, A. Hightower, C.C. Ahn and B. Fultz "EELS of the Electronic Structure and Local Structure of Metals" in Transmission Electron Energy Loss Spectrometry in Materials Science and the EELS Atlas Second Edition, edited by C. C. Ahn (Wiley-VCH, Weinheim, 2004) Chapter 9 pp. 317-352.
17. B. Fultz and J. J. Hoyt, "Phase Equilibria and Phase Transformations" Chapter 7 in Alloy Physics, edited by Wolfgang Pfeiler (Wiley-VCH, Weinheim, 2007). ISBN-10: 3-527-31321-4. ISBN-13: 978-3-527-31321-1.
18. B. Fultz, "Vibrational Thermodynamics of Materials", in preparation for Progress in Materials Science.

Refereed Publications in Archival Journals

19. B. Fultz and J. W. Morris, Jr., "Multichannel Scaling with an Eight Bit Microcomputer", *Rev. Sci. Instr.* 49 (1978) 1216.
20. C. K. Syn, B. Fultz, and J. W. Morris, Jr., "Mechanical Stability of Retained Austenite in Tempered 9Ni Steel", *Metall. Trans.* 9A (1978) 1635-1640.
21. B. Fultz and J. W. Morris, Jr., "The Thickness Distortion of ⁵⁷Fe Backscatter Mössbauer Spectra", *Nucl. Instr. and Meth.* 188 (1981) 197-201.
22. B. Fultz and J. W. Morris, Jr., "The Thickness Distortion of ⁵⁷Fe Backscatter Mössbauer Spectra: Effects of Secondary Resonant Absorptions", *Nucl. Instr. and Meth.* 211 (1983) 569-570.
23. B. Fultz, A. DuBois, H. J. Kim, and J. W. Morris, Jr., "Cryogenic Mechanical Properties of Superalloy MP35N", *Cryogenics* 11 (1984) 687-690.
24. B. Fultz and J. W. Morris, Jr., "A Mössbauer Spectrometry Study of the Mechanical Transformation of Precipitated Austenite in 6Ni Steel", *Metall. Trans.* 16A (1985) 173-177.
25. B. Fultz, J. I. Kim, Y. H. Kim, H. J. Kim, G. O. Fior, and J. W. Morris, Jr., "The Stability of Precipitated Austenite and the Toughness of 9Ni Steel", *Metall. Trans.* 16A (1985) 2237-2249.

26. B. Fultz and J. W. Morris, Jr., "The Mechanical Stability of Precipitated Austenite in 9Ni Steel", *Metall. Trans.* 16A (1985) 2251-2256.
27. B. Fultz and J. W. Morris, Jr., "Effects of High Magnetic Fields on the Flow Stress of 18-8 Stainless Steels", *Acta Metall.* 34 (1986) 379-384.
28. B. Fultz and J. W. Morris, Jr., "The Temperature Dependence of the ^{57}Fe Hyperfine Field Distribution in Fe-Ni ", *Hyperfine Interactions* 28 (1986) 553-556.
29. B. Fultz, J. I. Kim, Y. H. Kim, and J. W. Morris, Jr., "The Chemical Composition of Precipitated Austenite in 9Ni Steel", *Metall. Trans.* 17A (1986) 967-972.
30. B. Fultz and J. W. Morris, Jr., "The Temperature Dependence of Hyperfine Magnetic Fields in Fe-Ni ", *Phys. Rev.* 34B (1986) 4480-4489.
31. B. Fultz, "Suppressed Kinetics of Short Range Ordering at Low Temperatures", *J. Chem. Phys.* 87 (1987) 1604-1609.
32. W. J. Meng, B. Fultz, E. Ma, and W. L. Johnson, "Solid State Interdiffusion Reactions in Ni/Ti and Ni/Zr Multilayered Thin Films", *Appl. Phys. Lett.* 51 (1987) 661-663.
33. D. H. Pearson, B. Fultz, and C. C. Ahn, "Measurement of $3d$ State Occupancy in Transition Metals Using Electron Energy Loss Spectrometry", *Appl. Phys. Lett.* 53 (1988) 1405-1407.
34. S. M. Anlage, B. Fultz, and K. M. Krishnan, "Icosahedral Phase Formation in Rapidly Quenched Aluminum-Ruthenium Alloys", *J. Materials Research*, 3 (1988) 421-425.
35. W. J. Meng, C. W. Nieh, E. Ma, B. Fultz, and W. L. Johnson, "Solid State Interdiffusion Reactions of Ni/Zr Diffusion Couples", *Materials Science and Engineering* 97 (1988) 87-91.
36. B. Fultz, "Short Range Order in FeCo-X Alloys", *Hyperfine Interactions*, 41 (1988) 607-610.
37. B. Fultz, "An Effect of Antiphase Boundaries on the Kinetics of Short Range Ordering by a Vacancy Mechanism", *J. Chem. Phys.* 88 (1988) 3227-3229.
38. Z. Mei, B. Fultz, and J. W. Morris, Jr., "Intensities of Backscatter Mössbauer Spectra", *J. Appl. Phys.* 64 (1988) 2550-2555.
39. B. Fultz, "Kinetic Paths in Two Order Parameters: Theory", *Acta Metall.* 37 (1989) 823-829.
40. B. Fultz, H. H. Hamdeh, and D. H. Pearson "Kinetic Paths in Two Order Parameters: A Mössbauer Spectrometry Experiment with FeCo-Mo ", *Acta Metall.* 37 (1989) 2841-2847.
41. B. Fultz and H. H. Hamdeh, "Kinetics of Ordering in Metallic Alloys", *Hyperfine Interactions* 45 (1989) 55-72.

42. B. Fultz and L. Anthony. "Vacancy Trapping in Lattices with Different Coordination Numbers", *Phil. Mag. Lett.* 59 (1989) 237-241.
43. B. Fultz, G. Le Caër, and P. Matteazzi, "Mechanical Alloying of Fe and V Powders: Intermixing and Amorphous Phase Formation", *J. Mater. Res.* 4 (1989) 1450-1455.
44. L. Anthony and B. Fultz, "Kinetic Paths of B2 and DO₃ Order Parameters: Theory", *J. Mater. Res.* 4 (1989) 1132-1139.
45. L. Anthony and B. Fultz, "Kinetic Paths of B2 and DO₃ Order Parameters: Experiment", *J. Mater. Res.* 4 (1989) 1140-1142.
46. H. H. Hamdeh, B. Fultz, and D. H. Pearson "A Mössbauer Spectrometry Study of the Hyperfine Fields and Electronic Structure of Fe-Co Alloys", *Phys. Rev. B*, 39 (1989) 11233-11240.
47. B. Fultz and H. H. Hamdeh, "A Mössbauer Spectrometry Study of Ordering in Fe-Co", *Phil. Mag. B* 60 (1989) 601-615.
48. H. Ouyang and B. Fultz, "Percolation in Alloys with Thermally Activated Diffusion", *J. Appl. Phys.* 66 (1989) 4752-4755.
49. J. W. Morris, Jr., B. Fultz, J. W. Chan, and Z. Mei, "The Influence of High Magnetic Fields on the Mechanical Properties of Metastable Austenitic Stainless Steels", *Fizika Nizkikh Temperatur* 15 (1989) 1072-1080.
50. B. Fultz, H. H. Hamdeh, and J. Okamoto, "Hyperfine Magnetic Fields in Fe-Co Alloys and their Temperature Dependences", *Hyperfine Interactions* 54 (1990) 799-803.
51. B. Fultz, Z-Q. Gao and H. H. Hamdeh, "Short Range Ordering in Undercooled Fe₃Al", *Hyperfine Interactions*, 54 (1990) 521-526.
52. B. Fultz, "Kinetics of Short- and Long-Range B2 Ordering in the Pair Approximation", *J. Materials Research* 5 (1990) 1419-1430.
53. B. Fultz, "Nonintuitive Features of Disorder→Order Transformations", *J. Less-Common Metals*, 168 (1991) 145-157.
54. G. Le Caër, P. Matteazzi, E. Bauer-Grosse, B. Fultz, and A. Pianelli, "Mössbauer Study of Mechanical Alloying in Fe-V and Fe-C Alloys", *J. de Physique Colloque* 51 (1990) C4-151-155.
55. H. H. Hamdeh, J. Okamoto, and B. Fultz "Temperature-dependence of hyperfine magnetic fields in Fe-Co alloys", *Phys. Rev. B* 42 (1990) 6694-6696.
56. E. H. Fowles, J. A. Labinger, J. L. Beauchamp, and B. Fultz, "Fast Ion Conductors as Oxidation Catalysts: Oxidative Coupling and Deep Oxidation of Methane over Transition-Metal-Exchanged β"-Aluminas, *J. Phys. Chem.* 95 (1991) 7393-7400.
57. H. Kuwano, H. Ouyang, and B. Fultz, "A Mössbauer Spectrometry Study of Nanophase Cr-Fe Synthesized by Mechanical Alloying: A Measurement of Grain Boundary Width", *Nanostructured Materials*, 1 (1992) 143.

58. B. Fultz, "Kinetics of short-range and long-range B2 ordering in FeCo", *Phys. Rev. B* 44 (1991) 9805-9811.
59. J. Bach, B. Krueger, and B. Fultz, "Shock wave consolidation of a Ni-Cr-Si-B metallic glass powder", *Mater. Lett.* 11 (1991) 383-388.
60. S. R. Harris, D. H. Pearson, C. M. Garland, and B. Fultz, "Chemically Disordered Ni₃Al Synthesized by High Vacuum Evaporation", *J. Mater. Res.* 6 (1991) 2019-2021.
61. B. Fultz, "Kinetics of short- and long-range B2 ordering in ternary alloys", *J. Mater. Res.* 7 (1992) 946-954.
62. H. Kuwano, H. Ouyang, and B. Fultz, "A Mössbauer Spectrometry Study of the Magnetic Properties and Debye Temperature of Nanocrystalline Cr-Fe", *Materials Science Forum* 88-90 (1992) 561-568.
63. G. Le Caër, P. Matteazzi, and B. Fultz, "A Microstructural Study of the Mechanical Alloying of Fe and Sn Powders", *J. Mater. Res.* 7(6) (1992) 1387-1395.
64. B. Fultz, "Pseudo-stable States", *Philos. Mag. B* 67 (1993) 253-262.
65. L. Anthony, J. K. Okamoto, and B. Fultz, "Vibrational Entropy of Ordered and Disordered Ni₃Al", *Phys. Rev. Lett.* 70 (1993) 1128-1130.
66. H. Kuwano, H. Morita, Y. Hamaguchi, H. Ouyang, and B. Fultz, *J. Japan Society of Powder and Powder Metallurgy* 39 (1992) 1080-1084.
67. L. Anthony and B. Fultz, "Kinetics of B2, D0₃ and B32 ordering: Results from pair approximation calculations and Monte Carlo simulations", *J. Mater. Res.* 9 (1994) 348-356.
68. Z. Q. Gao and B. Fultz, "Transient B32-like order during the early stages of ordering in undercooled Fe₃Al", *Philos. Mag. B* 67 (1993) 787-800.
69. D. H. Pearson, C. C. Ahn, and B. Fultz, "White lines and d-electron occupancies for the 3d and 4d transition metals", *Phys. Rev. B* 47 (1993) 8471-8478.
70. R. C. Bowman, Jr., F. E. Lynch, R. W. Marmaro, C. H. Luo, B. Fultz, J. S. Cantrell, and D. Chandra, "Effects of Thermal Cycling on the Physical Properties of VH_x", *Z. Phys. Chem. N. F.*, 181 (1993) 827-831.
71. B. Fultz, C. C. Ahn, S. Spooner, L. B. Hong, J. Eckert and W. L. Johnson, "Incipient Chemical Instabilities of Nanophase Fe-Cu Alloys Prepared by Mechanical Alloying", *Metall. and Mater. Trans. A* 27 (1996) 2934-2946.
72. B. Fultz and Z.Q. Gao, "A Mössbauer spectrometry study of hyperfine magnetic fields and ordering in Fe₃Al", *Nucl. Instr. and Methods in Phys. Res.* B76 (1993) 115-120.
73. Z. Gao and B. Fultz, "The Thermal Stability of Nanocrystalline Fe-Si-Nb Prepared by Mechanical Alloying", *Nanostructured Materials* 2 (1993) 231-240.

74. H. H. Hamdeh, S. A. Oliver, B. Fultz and Z. Q. Gao, "Structure and magnetic properties of sputtered thin films of $\text{Fe}_{0.79}\text{Ge}_{0.21}$ ", J. Appl. Phys. 74 (1993) 5117-5123.
75. T. F. Lindsey and B. Fultz, "Microstructural dependence of vacancy diffusion in ordered alloys", J. Appl. Phys. 75 (1994) 1467-1472.
76. B. Fultz, Z-Q. Gao, H. H. Hamdeh, and S. A. Oliver, "Local and nonlocal isomer shifts in bcc Fe-X Alloys (X=Al,Si,Ga,Ge)", Phys. Rev. B 49 (1994) 6312-6315.
77. T. A. Stephens, W. Keune, and B. Fultz, "Mössbauer Effect Diffraction from Polycrystalline ^{57}Fe " Hyperfine Interactions, 92 (1994) 1095-1100.
78. Z. Gao and B. Fultz, "Thermal Stability of Fe_3Si -Based Nanocrystals" Hyperfine Interactions 94 (1994) 2213-2218.
79. H. H. Hamdeh, J. Kramer, B. Fultz, Z. Q. Gao, and S. A. Oliver, "Hyperfine Fields and Chemical Order in Fe-Ge" Hyperfine Interactions, 94 (1994) 2373-2378.
80. Z. Gao and B. Fultz, "Kinetics of Ordering in Fe_3Si ", Hyperfine Interactions 94 (1994) 2361-2366.
81. B. Fultz, H. Kuwano, and H. Ouyang, "Average Widths of Grain Boundaries in Nanophase Alloys Synthesized by Mechanical Attrition", J. Appl. Phys. 77 (1995) 3458-3466.
82. B. Fultz, "The Kinetic Stability of Alloys having Periodic Minimal Surface Microstructures", Philos. Mag. A 70 (1994) 607-619.
83. D. H. Pearson, C. C. Ahn, and B. Fultz, "Measurements of 3d occupancy from Cu $L_{2,3}$ electron energy loss spectra of rapidly quenched CuZr, CuTi, CuPd, CuPt, and CuAu", Phys. Rev. B 50 (1994) 12969-12972.
84. J. K. Okamoto, C. C. Ahn, and B. Fultz, "Short-range ordering in fcc Ni_3Al ", J. Appl. Phys. 77 (1995) 4380-4383.
85. R. C. Bowman, C. Luo, C. C. Ahn, C. K. Witham, and B. Fultz, "The Effect of Tin on the Degradation of $\text{LaNi}_{5-y}\text{Sn}_y$ Metal Hydrides during Thermal Cycling", J. Alloys Compounds 217 (1995) 185-192.
86. L. B. Hong, C. Bansal, and B. Fultz, "Steady State Grain Size and Thermal Stability of Nanophase Ni_3Fe and Fe_3X (X=Si, Zn, Sn) Synthesized by Ball Milling at Elevated Temperatures", NanoStructured Materials, 4 (1994) 949-956.
87. Z. Q. Gao and B. Fultz, "Inter-Dependence of Grain Growth, Nb Segregation, and Chemical Ordering in Fe-Si-Nb Nanocrystals", NanoStructured Materials 4 (1994) 939-947.
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 301. C. C. Ahn, Y. Ye, B. V. Ratnakumar, C. Witham, R. C. Bowman, Jr., and B. Fultz, "Carbon as a High Capacity Solid State Storage Medium for Hydrogen", Proc. 14th Annual Battery Conference on Applications and Devices, Long Beach, CA, January, 1999, H. A. Frank and E. T. Seo, eds., (Inst. Electrical Electronic Engs., Piscataway, NJ) IEEE 99TH8371, p. 67-71.
 302. C. K. Witham, A. Hightower, B. V. Ratnakumar, R. C. Bowman, Jr., and B. Fultz, " $\text{LaNi}_{5-x}\text{M}_x$ Alloys in Rechargeable Batteries: Factors affecting Cycle Lifetimes", Proc. 14th Annual Battery Conference on Applications and Devices, Long Beach, CA, January, 1999, H. A. Frank and E. T. Seo, eds., (Inst. Electrical Electronic Engs., Piscataway, NJ) IEEE 99TH8371, p. 61-65.

303. A. Hightower, J. Graetz, C. C. Ahn, B. Fultz and P. Rez, "The Valence of Li in Graphite", submitted to the Proceedings of the Electrochemical Society Annual Meeting, Phoenix, 2000.
304. C. C. Ahn, Y. Ye, B. Fultz, J. J. Vajo, and J. J. Zinck, "Hydrogen Storage in Single Walled Carbon Nanotubes", Proceedings of the 10th Canadian Hydrogen Conference, T. K. Bose and P. Bernard, Eds., (Canadian Hydrogen Association, Quebec, 2000) ISBN 0-9696869-5-1, pp. 392-399.
305. H. Gabrisch, R. Yazami, and B. Fultz, "Electron Diffraction and X-Ray Studies of New LiC₁₀ and LiC₈ Structures in Chemically Lithiated Single Wall Carbon Nanotubes," Proceedings of the 200th Meeting of The Electrochemical Society, San Francisco, Oct., 2001.
306. J. Graetz, A. Hightower, C. C. Ahn, R. Yazami, P. Rez, and B. Fultz, "Electron Energy-Loss Spectrometry and Mapping of Oxygen in Delithiated LiCoO₂", Proceedings of the 200th Meeting of The Electrochemical Society, San Francisco, Oct., 2001.
307. M. E. Manley, B. Fultz, R. J. McQueeney, W. L. Huls, J. L. Smith, D. J. Thoma, C. M. Brown, R. Osborn, and J. L. Robertson, "The Nature of Vibrational Softening in α -Uranium", Materials Science and Engineering Laboratory, FY2001 Programs and Accomplishments, NIST Center for Neutron Research, Sept. 2001. NISTIR 6798.
308. Yvan Reynier, Brent Fultz and Rachid Yazami, "Thermodynamics and kinetics of self-discharge in graphite-lithium electrodes" Proc. 17th Annual Battery Conference on Applications and Devices, Long Beach, CA, January, 2002, E. T. Seo, ed., (Inst. Electrical Electronic Eng., Piscataway, NJ). IEEE 02TH8576 p. 145.
309. Brent Fultz and Doug Abernathy, "ARCS: A High-Resolution Direct-Geometry Chopper Spectrometer at the SNS" The Neutron Pulse 2 (2) p. 6-7 (Spallation Neutron Source User Administration Office, Oak Ridge, TN, 2001).
310. R. Yazami, Y. Ozawa, H. Gabrisch, and B. Fultz, "High Voltage Aging of LiCoO₂", Proceedings of the 203rd Meeting of The Electrochemical Society, Paris, France, May, 2003.
311. H. Gabrisch, R. Yazami, and B. Fultz, "Reversible and Irreversible Phase Transformations in LiCoO₂", Proceedings of the 203rd Meeting of The Electrochemical Society, Paris, France, May, 2003.
312. R. Yazami, Y. Ozawa and B. Fultz, "Chemical self-discharge in the lithium cobalt oxide cathode", Proceedings of the 203rd Meeting of The Electrochemical Society, Paris, France, May, 2003.
313. Y. Ozawa, R. Yazami and B. Fultz, "Self-discharge mechanisms in delithiated cobalt oxide ", Proceedings of the 204th Meeting of The Electrochemical Society, Orlando, Florida, Sept, 2003.

314. H. Gabrisch, R. Yazami and B. Fultz, "In-Situ TEM Studies of Crystal Structure Transformations in $\text{Li}_{1-x}\text{CoO}_2$ at Elevated Temperatures", Proceedings of the 204th Meeting of The Electrochemical Society, Orlando, Florida, Sept, 2003.
315. B. Fultz, Y. Reynier, J. Graetz, T. Swan-Wood, P. Rez, "Origin of Entropy of Intercalation of Li into Li_xCoO_2 " in Advanced Materials For Energy Conversion II, Edited by D. Chandra, R. G. Bautista and L. Schlapbach (TMS Warrendale, PA, 2004) ISBN 0-87339-574-3 p. 311-316.
316. M. E. Manley, R. J. McQueeney, B. Fultz, T. Swan-Wood, O. Delaire, E. A. Goremychkin, J. C. Cooley, W. L. Hults, J. C. Lashley, R. Osborn, J. L. Smith, "The importance of high temperature electron-phonon coupling to the thermodynamic properties of $\text{Ce}_{0.9}\text{Th}_{0.1}$ and other f-electron bonded metals", Mater. Res. Soc. Symp. Proc. Vol. 802 (Materials Research Society, 2004) DD2.3.1.
317. O. Delaire, T. Kelley, T. Swan-Wood, M. Kresch, and B.T. Fultz, "Phonon Thermodynamics of Transition Metals and Alloys", LANSCE Activity Report 2005, Los Alamos National Laboratory. LA-UR-05-2861.
318. M. McKerns, J. McCorquodale, and B. Fultz, "Distributed Analysis of Neutrons Scattering Experiments on the TeraGrid", Oak Ridge National Laboratory report for requisition 3400050128-00001 (2005).
319. James R. Morris, Xun-Li Wang, and Brent Fultz, "Neutron Scattering Applied to Materials Problems," Commentary in JOM, 58 (3): MAR 2006.

Student Papers and Awards Supervised:

320. L. Anthony, "Kinetics of Long Range Ordering in Fe_3Al ", 1989 AIME-TMS Student Paper Award in the Materials Science category.
321. D. H. Pearson, "Measurements of White Line Intensities in 4d Transition Metals using Electron Energy Loss Spectrometry (EELS)", Proceedings of the 47th Annual Meeting of the Electron Microscopy Society of America, G. W. Bailey, ed.(San Francisco Press, 1989) 386-387.
322. Joseph Bach, "Shock Wave Consolidation of Metallic Glasses", Proceedings of the Fourth National Conference on Undergraduate Research, Schenectady, New York, April, 1990.
323. L. Anthony, "A Kinetic Path Theory of B2 and D0₃ Ordering", 1990 AIME-TMS Student Paper Award in the Materials Science category.
324. J. Okamoto, "Measurements of Short-Range Ordering in Ni_3Al ", submitted to the TMS Student Paper Competition 1991.
325. Z.Q. Gao, "X-Ray Diffraction Study of Ordering in Fe_3Al ", submitted to the TMS Student Paper Competition 1991.

326. Michael Manley, "Low Temperature Inelastic Neutron Scattering Study of Phases of Cerium", First Prize Student Poster Competition, Los Alamos Neutron Science Center (LANSCE) Users' Group Meeting, August 1998.
327. Peter Bogdanoff, "Vibrational Entropies of Cu-Au Alloys", First Prize Student Poster Competition, Los Alamos Neutron Science Center (LANSCE) Users' Group Meeting, January, 2000.
328. Michael Manley, "Vibrational Softening in α -Uranium", Los Alamos Science, Nov. 26, 2000 (LA-UR-00-4100) p. 202-207.
329. Michael Manley, Eighteenth Rosen Prize of the Los Alamos Neutron Science Users Group, Aug. 12, 2001. (Prize for best Ph.D. thesis at LANSCE, \$1,000 plus plaque.)
330. Olivier Delaire "Thermodynamics of phonons and electrons in vanadium alloys" student Poster Prize at the American Conference on Neutron Scattering, St. Charles, IL June, 2006. (\$500 plus plaque)
331. Olivier Delaire, Twentieth Rosen Prize of the Los Alamos Neutron Science Users Group, 2008. (Prize for best Ph.D. thesis at LANSCE, \$1,000 plus plaque.)

Conferences and Symposia Organized:

B. Fultz, C. C. Ahn, and M. Disko, "Transmission Electron Energy Loss Spectroscopy in Materials Science" TMS Annual Meeting, New Orleans, Feb. 1991.

Organizing Committee, European Workshop on Ordering and Disordering, Grenoble, France, July 10-12, 1991.

B. Fultz, R. Cahn, D. Gupta "Diffusion in Ordered Alloys" TMS-ASM Fall Meeting, Chicago, 1992.

Program Committee of the International Conference on the Applications of the Mössbauer Effect, 1993, Vancouver (ICAME'93).

R. Shull, B. Fultz P. Maziasz, and C. C. Koch, "Structure and Properties of Nanophase Materials" TMS Annual Meeting, Las Vegas 1995.

J. W. Cahn, B. Fultz, L-Q. Chen, J. Simmons, J. Morrall and J. Manning, "Mathematics of Thermodynamically-Driven Microstructural Evolution" TMS Fall Meeting, Cleveland, 1995.

International Advisory Committee, International Conference on Diffusion in Materials, DIMAT'96, Münster, FRG.

B. Fultz, R. Shull, E. Ma, J. Morrall, and P. Nash, "Chemistry and Physics of Nanostructures and Related Non-Equilibrium Materials", TMS Annual Meeting, Orlando, FL Feb. 9-13, 1997.

International Advisory Committee, The International Symposium on the Industrial Applications of the Mössbauer Effect, ISIAME 2000, Virginia Beach, Virginia, August 13-18, 2000.

Program Committee of the International Conference on the Applications of the Mössbauer Effect, 2001, Oxford, England (ICAME'01).

B. Fultz and X-L. Wang, "Doing Science with Neutron Scattering Data" American Conference on Neutron Scattering, College Park, MD June 6-10, 2004.

B. Fultz and M. Atzmon "Neutron Scattering in Materials Research" TMS Annual Meeting, San Francisco, CA Feb. 13-17, 2005.

B. Fultz, "Collaborative Software Development", symposium at NOBUGS 2008 Australian Nuclear Science and Technology Organisation, Nov. 3-5, 2008.

Invited Technical Presentations:

B. Fultz and J. W. Morris, Jr., "Magneto-Mechanical Effects in 304 Stainless Steels", Int'l Cryogenic Materials Conf., Colorado Springs, Co., Aug., 1983.

B. Fultz, "In-Situ Mössbauer Spectroscopy Studies of Phase Transformations", AIME Symposium on In-Situ Studies of Phase Transformations", TMS-AIME Fall Meeting, Detroit, Mich., Sept., 1984.

B. Fultz, "Hyperfine Magnetic Field Distributions in Fe-Ni and Fe-10-Ni-1X", Symposium on Industrial Applications of the Mössbauer Effect, 1984 Int'l Chemical Congress of Pacific Basin Socs., Honolulu, Ha., Dec. 16-21, 1984.

B. Fultz, "The Effects of High Magnetic Fields on the Mechanical Properties of Stainless Steels", Carpenter Technology Corporation, Reading, PA, Sept. 19, 1986.

B. Fultz "Kinetics of Short Range Ordering in Undercooled Alloys" University of California, Los Angeles (Oct., 1987)
Arizona State University (Nov., 1987)

B. Fultz "Kinetics of Ordering in Metallic Alloys", International Conference on the Industrial Applications of the Mössbauer Effect, Parma, Italy (Sept., 1988).

B. Fultz "Kinetic Paths of Ordering in Metallic Alloys",
Purdue University, West Lafayette (April, 1989)
University of Washington, Seattle (June, 1989)
University of Southern California, Los Angeles (Oct., 1989)

B. Fultz "Nonintuitive Features of Disorder→Order Transformations", Annual Meeting of The Minerals, Metals, and Materials Society, Anaheim (Feb., 1990).

B. Fultz, H. Kuwano, and H. Ouyang "A Mössbauer Spectrometry Study of Nanophase Cr-Fe Synthesized by Mechanical Alloying", Acta Metallurgica Conference on Materials with Ultrafine (Nanoscale) Microstructures, Atlantic City, New Jersey, Oct., 1990.

B. Fultz, "Ultrafine Microstructures Produced by Ball Milling", Jacob Wallenberg Seminar, Utrecht, The Netherlands, Dec. 6, 1990.

- B. Fultz, "Kinetic Paths of Ordering in Nonequilibrium Alloys", European Workshop on Ordering and Disordering, Grenoble, June 10-12, 1991.
- B. Fultz, "Grain Boundary Widths of FCC and BCC Nanophase Materials Prepared by Mechanical Attrition", TMS Annual Meeting, San Diego, 1992.
- B. Fultz, "Kinetics of Disorder→Order Transformation", the Jerome B. Cohen Symposium at the TMS Annual Meeting, San Diego, 1992.
- B. Fultz, "Mössbauer Spectrometric Studies of Ordering in Alloys", International Symposium on the Industrial Applications of the Mössbauer Effect, Otsu, Japan, August, 1992.
- B. Fultz, "Monte Carlo Simulations of Ordering Kinetics", TMS-AMS Fall Meeting, Chicago, November, 1992.
- B. Fultz, "Transient States During the Kinetic Evolution of Non-Equilibrium Materials", Hume-Rothery Symposium (in honor of J. W. Cahn) at the TMS Annual Meeting, Denver, February, 1993.
- B. Fultz, "Thermal Stability of Nanophase Materials Prepared by Mechanical Attrition", TMS Annual Meeting, San Francisco, 1994.
- B. Fultz, "Phase Transformations in Materials Far from Thermodynamic Equilibrium", International Conference on Solid-to-Solid Phase Transformations, Nemaquin Woodlands, PA, July, 1994.
- B. Fultz, "The magnitude and origin of changes in vibrational entropy during solid-state phase transformations", American Physical Society March meeting, 1995.
- B. Fultz, "Alloy Design of LaNi₅-based Materials for Battery Electrodes and Hydrogen Storage", Gordon Research Conference on Hydrogen-Metal Systems, July 16-21, 1995.
- B. Fultz and T. A. Stephens, "Mössbauer Diffraction from Polycrystalline Ordered Alloys", 10th International Conference on Hyperfine Interactions, Leuven, Belgium, August 28 - Sept. 1, 1995.
- B. Fultz, "Kinetics of Short- and Long-Range B2 Ordering in Ternary Alloys", TMS Fall Meeting, Cleveland, OH, Oct.-Nov. 1995.
- B. Fultz and L. B. Hong, "Phase Boundaries in Mechanical Alloying", TMS Fall Meeting, Cleveland, OH, Oct.-Nov. 1995.
- B. Fultz, "Some New Experiments Based on the Mössbauer Effect", Dept. of Physics and Astronomy, University of Toledo, Toledo, Ohio, Nov. 2, 1995.
- B. Fultz, "Designing Nanocrystalline Alloys with Stability Against Grain Growth", TMS Annual Meeting, Anaheim, CA, Feb. 7, 1996.
- Discussion Leader, 1996 Gordon Conference on Physical Metallurgy.
- B. Fultz, "Two New Experiments Based on the Mössbauer Effect", Dept. of Physics, University of Ottawa, Ottawa, Canada, Aug. 26, 1996.

- B. Fultz, "Vibrational Entropy of Materials", Condensed Matter Physics Colloquium, Los Alamos National Laboratory, March 6, 1997.
- B. Fultz, "Two New Methods for Materials Characterization Based on the Mössbauer Effect", Physics Dept. Colloquium, Univ. Texas, El Paso, Mar 26, 1997.
- B. Fultz, "Phonon Partial Densities of States of ^{57}Fe in Alloy Phases", Workshop on Inelastic Nuclear Resonant Scattering", Argonne National Laboratory, April 21 - 22, 1997.
- B. Fultz, "Vibrational Entropy of Metals and Alloys", Workshop on Local Structure from Diffraction, Traverse City, Michigan Aug. 10-14, 1997.
- B. Fultz, "Mössbauer Diffraction from Polycrystalline Alloys", International Conference on the Applications of the Mössbauer Effect, Rio de Janeiro, Brazil, September 14-20, 1997.
- B. Fultz and L. J. Nagel, "Anharmonic Effects on the Vibrational Entropy of Alloy Phases", TMS Fall Meeting, Indianapolis, IN, Sept. 14-18, 1997.
- B. Fultz, "Vibrational Entropy and Phonon Densities of States of Materials", U. C. San Diego Condensed Matter Physics Colloquium, Oct. 8, 1997.
- B. Fultz, "Improved Alloys for Ni-MH Batteries", Materials Research Society Spring 1998 Symposium on Hydrogen in Semiconductors and Metals, San Francisco, April, 1998.
- M. E. Manley, L. J. Nagel, and B. Fultz, "Vibrational Entropy Difference between Ordered and Disordered Pd_3V ", Hume-Rothery Symposium for R. Kikuchi, TMS Annual Meeting, San Antonio, Feb. 16, 1998.
- B. Fultz, H. Frase, C. C. Ahn, J. L. Robertson, S. Spooner, E. E. Alp, W. Sturhahn, T. S. Toellner, R. McQueeney, "Vibrations of Nanocrystals", TMS Annual Meeting, San Antonio, Feb. 16, 1998.
- B. Fultz, H. Frase, C. C. Ahn, J. L. Robertson, S. Spooner, E. E. Alp, W. Sturhahn, T. S. Toellner, R. McQueeney, "Vibrations of Nanocrystals", TMS Annual Meeting, San Antonio, Feb. 16, 1998.
- B. Fultz, H. Frase, C. C. Ahn, J. L. Robertson, S. Spooner, E. E. Alp, W. Sturhahn, T. S. Toellner, R. McQueeney, "Vibrations of Nanocrystals", TMS Annual Meeting, San Antonio, Feb. 16, 1998.
- B. Fultz, "Vibrational Entropy of Alloy Phases", Oak Ridge National Laboratory, Sept. 1, 1998.
- B. Fultz, "Vibrational Entropy of Alloy Phases", Sandia National Laboratory, Livermore, Nov. 24, 1998.
- B. Fultz, "Inelastic Nuclear Resonant Scattering and Mössbauer Diffractometry of Polycrystals", Physics Colloquium at Old Dominion University, Norfolk, VA, Feb. 11, 1999.

- B. Fultz, H. Frase, J. L. Robertson, "Heat Capacity, Phonons, and Vibrational Entropy of Nanocrystals", TMS Annual Meeting, San Diego, CA, February 1999.
- B. Fultz, "Vibrational Entropy of Alloy Phases", Solid State Sciences Seminar, California Institute of Technology, Pasadena, CA, March 9, 1999.
- B. Fultz, "Vibrational Entropy of Alloy Phases", MRS Spring Meeting, April 7, 1999.
- B. Fultz, C. C. Ahn, R. C. Bowman, Jr., B. V. Ratnakumar, Y. Ye, and C. K. Witham, "Hydrogen in Metals and on Carbons", HRL Laboratories, Malibu, CA, May 25, 1999.
- B. Fultz, "Vibrational Entropies of Alloy Phases", Workshop on Thermodynamic and Structural Properties of Alloy Materials, June 20 - 25, 1999 Oranjestad, Aruba.
- B. Fultz, "Vibrational Entropy and Inelastic Nuclear Scattering", Condensed Matter Seminar, Purdue University, Sept. 17, 1999.
- B. Fultz, "How Studies of Vibrational Entropy Bring Us to 3-ID", DOE Program Evaluation Board for Synchrotron Radiation Instrumentation Beamlines (SRI-CAT) at the Advanced Photon Source, Oct. 7, 1999.
- B. Fultz, "Entropies of Ordered Alloys", Intermetallics for the Third Millennium (ASM symposium in honor of R. W. Cahn, Nov. 1999).
- B. Fultz, "Inelastic Nuclear Resonant Scattering Studies of Phonons in Alloys", MRS Fall Meeting, Boston, Nov. 2, 1999.
- B. Fultz, "Inelastic Neutron Scattering Studies of Vibrational Entropy", LANSCE User's Group Meeting, Santa Fe, NM, Jan. 25, 2000.
- B. Fultz and H. N. Frase, "Grain Boundaries of Nanocrystalline Materials, TMS Annual Meeting, Nashville, TN Mar. 13, 2000.
- B. Fultz, "Vibrational Entropy of Alloy Phases", Materials Colloquium, Johns Hopkins University, Mar. 29, 2000.
- B. Fultz, "Vibrational Entropy of Materials", Materials Science and Mineral Engineering Colloquium, Univ. of Calif. Berkeley Aug. 31, 2000.
- B. Fultz, "The VERTEX Spectrometer", DOE review of the Short Pulse Spallation Source Enhancement Project, Los Alamos National Laboratory, Dec. 5, 2000.
- B. Fultz, "Mossbauer Diffractometry", Lujan Center Seminar, Los Alamos National Laboratory, Feb. 12, 2001.
- B. Fultz, "Mossbauer Diffraction of Materials", 12th International Conference on Hyperfine Interactions, Park City, Utah, Aug. 12-17, 2001.
- B. Fultz, "Structure and Dynamics of Nanocrystalline Materials," ASM Roundtable Meeting, The Boeing Company, Canoga Park, CA April 26, 2001.

- B. Fultz, "The ARCS Spectrometer", SNSWorkshop on the Cold Neutron Chopper Spectrometer, NIST Center for Neutron Research, Gaithersburg, MD, May 21, 2001.
- B. Fultz, "Mossbauer Diffraction of Materials", Materials Research Lecture, California Institute of Technology, May 30, 2001.
- A. F. Yue, I. Halevy, A. Papandrew, P. D. Bogdanoff, B. Fultz, W. Sturhahn, E. E. Alp, and T. S. Toellner "Phonons in intermetallic Pd₃Fe at high pressure", International Conference on the Applications of the Mössbauer Effect, Oxford, England, Sept. 3, 2001.
- B. Fultz, "Coherent and Incoherent Viewpoints of Neutron Scattering from Materials", Joint Institute for Neutron Scattering, Symposium on Studies of Fundamental Phenomena Using Neutrons, Oak Ridge, TN, Oct. 2, 2001.
- B. Fultz, "Excitations and Entropy of Solids Measured by Inelastic Scattering", Condensed Matter Physics Colloquium, Univ. Calif. San Diego, Oct. 17, 2001.
- B. Fultz, "Vibrational Entropy and Inelastic Scattering", Physics Division Colloquium, Argonne National Laboratory, Dec. 7, 2001.
- B. Fultz, "Inelastic Scattering and Vibrational Entropy", Lujan Center Seminar, Los Alamos National Laboratory, Dec. 10, 2001.
- B. Fultz, M. E. Manley, L. J. Nagel, H. Frase, P. D. Bogdanoff, J. L. Robertson, R. J. McQueeney, E. E. Alp, W. Sturhahn, and R. Osborn, "Sources of Entropy in Solid-Solid Phase Transformations", NIST Materials Theory Seminar, Gaithersburg, MD, Jan. 24, 2002.
- B. Fultz, J. Graetz, H. Gabrisch, R. Yazami, C. C. Ahn, "Transmission Electron Microscopy Studies of the Structure and Bonding in LiCoO₂" TMS Annual Meeting, Seattle, WA, Feb. 2002.
- B. Fultz, J.Y.Y. Lin, and U. Kriplani, "Mössbauer Diffractometry," Lecture at the NATO Advanced Research Workshop on Materials Research in Atomic Scale by Mössbauer Spectroscopy, Smolenice, Slovakia, June 2002.
- B. Fultz, J.Y.Y. Lin, and U. Kriplani, "Concluding Remarks," summary presentation at the NATO Advanced Research Workshop on Materials Research in Atomic Scale by Mössbauer Spectroscopy, Smolenice, Slovakia, June 2002.
- B. Fultz, "Anodes and Cathodes Studied by Electron Energy Loss Spectrometry", 11th International Meeting on Lithium Batteries, Monterey, California June 23-28, 2002.
- B. Fultz, "Hydrogen Distributions And Internal Strains In LaNi₅-X Hydrides" Gordon Research Conference on Hydrogen-Metal Systems, Colby College Waterville, ME July 13-18, 2003.

- B. Fultz and J. Y. Y. Lin, "Mossbauer Diffractometry Measurements of Site-Specific Long-Range Order in $^{57}\text{Fe}_3\text{Al}$ " Annual Meeting of the American Crystallographic Assn., (ACA) Covington, Kentucky, July 31, 2003.
- B. Fultz "ARCS: A wide-Angle Range Chopper Spectrometer for the Spallation Neutron Source", research seminar at the reactor FRM2, Munich Sept., 11, 2003.
- B. Fultz "Sources of Entropy in Solid-Solid Phase Transitions", Physics Colloquium at the Technical University of Munich, Sept., 12, 2003.
- B. Fultz "Transmission Electron Energy Loss Spectrometry Measurements on Electronic Structure of Anode and Cathode Materials for Lithium Batteries". LIBD 2003, Lithium Battery Discussion: Electrode Materials, Bordeaux - Arcachon, France, September 16, 2003.
- B. Fultz "Neutron Scattering Software – a User's Perspective", Neutron Science Software Initiative (NeSSI), Oak Ridge, Oct. 13-15, 2003.
- B. Fultz "Sources of Entropy in Solid-State Phase Transformations", TMS Annual Meeting, Charlotte, North Carolina March 15-18, 2004.
- B. Fultz "Origin of Entropy of Intercalation of Li into Li_yCoO_2 ", TMS Annual Meeting, Charlotte, North Carolina March 15-18, 2004.
- B. Fultz "Distributed Data Analysis for Neutron Scattering Experiments", NSF Workshop on Cyber Infrastructure April 21, 2004.
- B. Fultz "Nanostructured Anodes and Cathodes for Rechargeable Lithium Batteries" MIT Mechanical Engineering Department Seminar, Nov. 5, 2004.
- B. Fultz "Neutron Scattering and the Entropy of Materials" UCLA Materials Science and Engineering Department Seminar, Jan. 28, 2005.
- B. Fultz "The DANSE Project" Neutron Science Software Initiative Workshop NeSSI-3 at Bishop's Lodge, Santa Fe April 29, 2005.
- B. Fultz "Neutron Scattering and the Entropy of Materials" University of New Orleans Chemistry Dept. Colloquium, May 6, 2005.
- B. Fultz "Entropy of Solid-Solid Phase Transformations: Contributions from Vibrational Dynamics" Solid-Solid Phase Transformations in Inorganic Materials 2005 Pointe Hilton Resort at Squaw Peak, Phoenix, Arizona, June 2, 2005.
- S. Miao, M. Kocher, B. Fultz, P. Rez, Y. Ozawa, R. Yazami, and C. C. Ahn. "Local Electronic Structure of Layered $\text{Li}_x\text{Ni}_{0.33}\text{Mn}_{0.33}\text{Co}_{0.33}\text{O}_2$ " Electrochemical Society Fall Meeting, Los Angeles, October 18, 2005.
- B. Fultz "Mössbauer Diffractometry", Fourth Nassau Mössbauer Symposium, Garden City, NY Jan. 14, 2006.

- B. Fultz "Dynamic Data-Driven Data Applications Systems for the Domain of Neutron Scattering Research", Workshop at the National Science Foundation Headquarters, Jan. 19, 2006.
- O. Delaire, T. Swan-Wood, M. Kresch and B. Fultz "Thermodynamics of Impurities in Vanadium" TMS Annual Meeting, San Antonio, Texas March 12-16, 2006.
- B. Fultz "Inelastic Neutron Scattering and Entropy" Dept. of Physics Colloquium, Indiana University, Bloomington, Indiana May 30, 2006.
- B. Fultz "Nanostructured Materials for Lithium and Hydrogen Storage" Keynote talk at MIT Energy Nanotechnology International Conference, June 27, 2006.
- B. Fultz "Inelastic Neutron Scattering and Entropy" Dept. of Physics Colloquium, Occidental College, Los Angeles Sept. 12, 2006.
- B. Fultz "Neutrons and Thermodynamics", Colloquium for the Department of Materials Science and Engineering, University of California, Berkeley, Sept. 21, 2006.
- B. Fultz, J. Dodd, R. Stevens, I. Halevy, R. Yazami, B. Ellis, L.F. Nazar "Dynamical Studies on LiFePO_4 " Annual Meeting of the Electrochemical Society, Cancun, Mexico Oct. 30, 2006.
- B. Fultz, "Anharmonic Phonon Thermodynamics at High Temperatures", The U.S.-China Workshop Series on Neutron Scattering Science and Technology - The Inaugurating Meeting, Beijing, Nov. 13, 2006.
- B. Fultz, O. Delaire, M. Kresch, M. Lucas, T. Swan-Wood, J.L. Robertson, "Neutron Scattering and the Entropy of Materials" Hume-Rothery Award Symposium in honor of Simon Moss, TMS Annual Meeting, Orlando FL, Feb. 28, 2007.
- B. Fultz, "Materials that Store Hydrogen and Lithium", Jet Propulsion Laboratory (sponsored by the Office of the Chief Scientist and Chief Technologist) April 18, 2007.
- B. Fultz, "Neutron Scattering and the Entropy of Materials" Colloquium talk for the Department of Chemical Engineering and Materials Science, Univ. of Calif., Davis, Oct. 29, 2007.
- B. Fultz, invited workshop on "Enhanced National Capability for Neutron Scattering," Sept. 5-7, 2007, at the Humphrey's Half-Moon Bay Hotel in San Diego, CA.
- H. Tan, J. Dodd, and B. Fultz "Temperature and Composition Dependence of Electron Hopping in LiFePO_4 Studied by Mössbauer Spectrometry", Focused Battery Technology Workshop-III, Materials Challenges for High Energy Density and Long-life Lithium-Ion cells, Feb. 18,19, 2008 Caltech, Pasadena, CA.
- B. Fultz, invited workshop on "Building a Network for Neutron Scattering Education," Marriott Westfields, Chantilly, Virginia March 27-28, 2008.

- B. Fultz, "Pressure-Induced Invar Transitions" 5th International Nassau-Argonne Mössbauer Symposium, May 8-9, 2008 at Argonne National Laboratory, Argonne, Illinois, 60439, USA
- B. Fultz, "Entropy, Inelastic Neutron Scattering and Computation" June 11, 2008, Spallation Neutron Source science colloquium.
- B. Fultz, "Collaborative Software Development," Discussion Chair at NOBUGS 2008 November 3-5, 2008 in Sydney, Australia near the Australian Nuclear Science and Technology Organisation.
- B. Fultz, M. McKerns, M.A.G Aivazis "Technical and Management Issues in Collaborative Software Construction" NOBUGS 2008 November 3-5, 2008 in Sydney, Australia near the Australian Nuclear Science and Technology Organisation.
- B. Fultz, "Neutron Scattering and the Entropy of Materials " Colloquium talk for the Department of Materials Science and Engineering, Univ. of Calif., Irvine, Feb. 13, 2009.
- B. Fultz, "Inelastic Neutron Scattering Studies of Material Dynamics and Thermodynamics" TMS Annual Meeting, San Francisco, Feb. 17, 2009.
- B. Fultz, "Developments in Neutron Scattering and the Entropy of Materials" University of New Orleans AMRI Symposium Feb. 20, 2009.
- B. Fultz, "Neutron Scattering and the Entropy of Materials" Science Kickoff Talk for the DOE BES Triennial Review of Spallation Neutron Source and High Flux Isotope Reactor, Oak Ridge, Tennessee, March 24, 2009.
- B. Fultz, "DANSE and Inelastic Neutron Scattering" Fourth Workshop on Inelastic Neutron Spectrometers, Oak Ridge, Tennessee, May 1-2, 2009.
- B. Fultz, "Vibrational Thermodynamics at High Temperatures" Hume—Rothery Symposium in honor of Didier de Fontaine, TMS Annual Meeting, Seattle, WA Feb. 14-18, 2010.

ARCS Project

Principal Investigator for the construction of A wide Angular-Range, direct-geometry, time-of-flight Chopper Spectrometer (ARCS) at the Spallation Neutron Source in Oak Ridge, TN. This instrument will be optimized to provide a high neutron flux at the sample, and a large solid angle of detector coverage, advancing the science of dynamical processes in materials.

Proposal funded 15 Sept. 2001 at M\$ 14.9 over 5 years. CD4 Project Complete Oct. 1, 2007.

Inelastic Scattering Workshops Organized:

- ARCS IDT Meeting, breakout session of SHUG meeting, Oct. 12, 2005
- SEQUOIA/ARCS IDT Meeting, Caltech, Mar. 20, 2005
- Caltech-SNS Software Workshop, Caltech Dec. 13, 2002
- ARCS IDT Meeting, Los Alamos, Sept 30, 2002

DOE Baseline Review and Software Workshop, Caltech, March 14-16 2002
ARCS IDT Mini-meeting, Caltech, Sept 24, 2001

DANSE Project

Principal Investigator for DANSE: Distributed Data Analysis for Neutron Scattering Experiments. This is an NSF-funded construction project to build a new software system for doing neutron scattering science by computer. It includes software engineering and neutron science subprojects.

Design Proposal funded 3 Aug. 2004 at M\$ 0.98 over 1 year.

Construction Proposal funded 1 June 2006 at M\$ 11.97 over 5 years.

Software Workshops Organized:

DANSE Developers' Meeting, Caltech, May 27-29, 2009

DANSE Developers' Meeting, Caltech, Jan. 26-28, 2009

DANSE Developers' Meeting, Caltech, Aug. 25-27, 2008

DANSE Developers' Meeting, Caltech, Feb. 21-23, 2008

DANSE Developers' Meeting, Caltech, Sept. 20-22, 2007

DANSE Developers' Meeting, Manassas VA, May 29-31, 2007

DANSE Developers' Meeting, SNS, Jan. 22, 23, 2007

DANSE Kickoff Meeting, Caltech, Aug. 15, 16, 2006

DANSE Site Visit and Baseline Review, Oak Ridge TN, Dec. 15,16, 2005

DANSE Software Workshop and Developers' Meeting, Caltech, Mar. 16-19, 2005

DANSE Software Technology Workshop, Caltech, June 22-23, 2004.

DANSE Workshop, Caltech, Sept. 4-9, 2003

DANSE Organizational Meeting, Caltech, Mar 13, 2003

Present Graduate Students Supervised

Ryan Monson, Materials Science, Ph.D. expected 2009

Rebecca Stevens, Materials Science, Ph.D. expected 2009

Michael Winterrose, Materials Science, Ph.D. expected 2009

Chen Li, Materials Science, Ph.D. expected 2010

Justin Purewall, Materials Science, Ph.D. expected 2010

Hongjin Tan, Materials Science, Ph.D. expected 2011

Jorge Munoz, Materials Science, Ph.D. expected 2012

Lisa Mauger, Applied Physics, Ph.D. expected 2012

Nick Stadie (co-supervised with C.C. Ahn), Materials Science, Ph.D. expected 2012

David Abrecht (co-supervised with C.C. Ahn), Chemical Engineering, Ph.D.
expected 2012

Hillary Smith, Materials Science, Ph.D. expected 2013

Kunwoo Kim, Applied Physics, Ph.D. expected 2013

Former Ph.D. Students Supervised

1. Douglas Harvey Pearson, "Measurements of White Lines in Transition Metals and Alloys Using Electron Energy Loss Spectrometry", Ph.D. in Applied Physics, California Institute of Technology, September 30, 1991.
presently: Associate, Jones Day, Washington D.C.
2. Hao Ouyang, "Grain Boundaries of Nanophase Materials", Ph.D. in Materials Science, California Institute of Technology, October 12, 1992.
presently: Professor of Materials Science, National Chung Hsing University, Taiwan
3. James Kozo Okamoto, "Temperature-Dependent Extended Electron Energy Loss Fine Structure Measurements from K, L₂₃, and M₄₅ Edges in Metals, Intermetallic Alloys, and Nanocrystalline Materials", Ph.D. in Applied Physics, California Institute of Technology, May 6, 1993.
presently: Attorney at Law, deGuzman Okamoto & Benedicto LLP, 2672 Bayshore Pkwy, Suite 509, Mountain View, CA
4. Lawrence Anthony, "Kinetics of Disorder→Order Transformations in Highly Nonequilibrium Materials", Ph.D. in Materials Science, California Institute of Technology, May 24, 1993.
formerly: Assistant Prof. of Physics, Toledo Univ., present address unknown.
5. Zheng-Qiang Gao, "The Kinetics of Ordering, Grain Growth, and Chemical Segregation in Nonequilibrium Fe₃X Alloys (X = Al, Si, and Ge)", Ph.D. in Materials Science, California Institute of Technology, May 18, 1994.
presently: Pilkington Aerospace, California.
6. Liubo Hong, "Structures and Stabilities of Nanocrystalline Materials Synthesized by Mechanical Alloying and Modeled as Driven Alloys", Ph.D. in Materials Science, California Institute of Technology, Sept. 25, 1995.
presently: Director, Process Integration Engineering, Magic Technologies, 463 S. Milpitas Blvd., Milpitas, CA 95035.
7. Tab Allen Stephens, "Chemical Environment Selectivity in Mössbauer Diffraction", Ph.D. in Materials Science, California Institute of Technology, May 14, 1996.
presently: Motorola Research, Austin, TX
8. Laura Jeanne Nagel, "Vibrational Entropy Differences in Materials", Ph.D. in Materials Science, California Institute of Technology, June 18, 1996.
presently: Assistant Professor of Engineering Technology, West Texas A&M Univ., Amarillo, TX

9. Heather Nicole Frase, "Vibrational and Magnetic Properties of Mechanically Attrited Ni₃Fe Nanocrystals", Ph.D. in Materials Science, California Institute of Technology, April 9, 1998.
presently: member of technical staff, Institute for Defense Analyses, Alexandria, VA
10. Charles K. Witham, "The Effects of Alloy Chemistry on the Electrochemical and Hydriding Properties of Ni-Substituted LaNi₅", Ph.D. in Materials Science, California Institute of Technology, June 4, 1999.
presently: deceased Aug. 2002. Formerly technical staff, JPL.
11. Ushma Kriplani, "Kinematical Mössbauer Diffraction from Polycrystalline ⁵⁷Fe", Ph.D. in Physics, California Institute of Technology, April 18, 2000.
presently: Postdoctoral Fellow, Argonne National Lab.
12. Adrian Hightower, "Lithium Electronic Environments in Rechargeable Battery Electrodes", Ph.D. in Materials Science, California Institute of Technology, July 14, 2000.
presently: Assistant Professor of Physics, Occidental College.
13. Yun Ye, "Interaction of Hydrogen with Novel Carbon Materials", Ph.D. in Materials Science, California Institute of Technology, August 8, 2000.
presently: member of the Technical Staff, Siebel Systems
14. Michael E. Manley, "From Elementary Excitations to Microstructure: the thermodynamics of metals and alloys across length scales," Ph.D. in Materials Science, California Institute of Technology, April 25, 2001.
presently: Technical Staff Member, Lawrence Livermore National Lab., CA
15. Nathan R. Good, "The Influence of Texture on the Magnetoelastic Properties of Cold Rolled Polycrystalline TbDy Alloys" Ph.D. in Applied Physics, May 24, 2001.
presently: unknown. Formerly Postdoctoral Fellow, Jet Propulsion Laboratory, Pasadena CA.
16. Peter D. Bogdanoff, "The Phonon Entropy of Metals and Alloys: The effects of thermal and chemical disorder" Ph.D. in Materials Science, Nov. 20, 2001.
presently: Director of Research at a startup company, Pasadena, CA.
17. Jason Graetz, "Electronic Environments and Electrochemical Properties of Lithium Storage Materials", Ph.D. in Materials Science, May 7, 2003.
presently: Associate Materials Scientist, Brookhaven National Lab.
18. Jiao Lin, "Mössbauer Diffractometry: Principles, Practice, and an Application to a Study of Chemical Order in ⁵⁷Fe₃Al", Ph.D. in Materials Science, May 10, 2004.
presently: Member of the Professional Staff, Caltech.
19. Yvan Reynier, "Electrode Thermodynamics and Kinetics for Lithium-Ion Batteries" (co-advised with Dr. Rachid Yazami, CNRS, Directeur de These). Ph.D. in Materials Science, Grenoble University, France. May 25, 2005.
presently: Postdoctoral Fellow, CNRS, Grenoble.

20. Tabitha L. Swan-Wood, "Vibrational Entropy Contributions to the Phase Stability of Iron and Aluminum Based Binary Alloys", Ph.D. in Materials Science, August 12, 2005.
presently: Part-Time Physics Faculty, Physics Dept., California State Univ. Channel Islands.
21. Yasunori Ozawa, "Aging Study of Positive Electrode Materials for Lithium Ion Batteries" (main adviser was Dr. Rachid Yazami, CNRS, Directeur de These). Ph.D. in Materials Science, Grenoble University, France. October 19, 2005.
presently: Technical Staff, Enax Co., Japan.
22. Alexander B. Papandrew, "The Effects of High Pressure on the Vibrational and Magnetic Properties of Iron-Based Materials" Ph.D. in Materials Science, January 23, 2006.
presently: Senior Scientist, Superprotonic, Pasadena CA.
23. Olivier Delaire, "The Phonon Entropy of BCC Transition Metals and Alloys: Effects of Impurities and of a Martensitic Phase Transition" Ph.D. in Materials Science, May 12, 2006.
presently: Clifford Shull Postdoctoral Fellow, Oak Ridge National Lab.
24. Shu Miao, "Electronic Structure of Energy Storage Materials" Ph.D. in Materials Science, Jan. 30, 2007.
presently: Postdoctoral Fellow, CNRS Toulouse, France.
25. Joanna Dodd, "Phase Composition and Dynamical Studies of Lithium Iron Phosphate" Ph.D. in Materials Science, March 14, 2007.
presently: Technical Staff Member, Aerospace Corp.
26. Matthew S. Lucas, "Cluster Expansion Method Applied to Inelastic Scattering Experiments" Ph.D. in Materials Science, July 25, 2008.
presently: postdoctoral fellow, Oak Ridge National Lab.
27. Max G. Kresch, "Temperature Dependence of Phonons in Elemental Cubic Metals Studied by Inelastic Scattering of Neutrons and X-Rays" Ph.D. in Materials Science, Nov. 17, 2008.
presently: member of technical staff, Institute for Defense Analyses, Alexandria, VA

Research Fellows/Visitors Presently Supported

Dr. Mike McKerns

Dr. Jiao Lin

Dr. J. Brandon Keith

Dr. Itzhak Halevy, NRCN, Beer - Sheva, Israel

Dr. Alex Dementsov

Dr. Nikolay Markovskiy

Research Fellows/Visitors Formerly Supported (often partial support)

Prof. Hussein Hamdeh (1987-89)
presently: Prof. of Physics, Wichita State University

Prof. Hisashi Kuwano (1989-90)
presently: Muroran Institute of Technology

Prof. Rainer Birringer (1991-92)
presently: Prof. of Materials Science, U. Augsburg, FRG

Prof. Werner Keune (1991)
presently: Prof. of Physics, U. Duisburg, FRG

Dr. Tim Lindsey (1992-93)
presently: member of technical staff, SAIC.

Prof. Chandrahas Bansal (1993-94)
presently: Prof. of Physics, U. Hyderabad, India

Dr. Marius Birsan, Jan. 1996 - Nov. 1997
presently: Defence Scientist, Defence Research & Development Canada Atlantic,
Dartmouth, Nova Scotia

Prof. Gerard Le Caër, Sept. 1996 - May 1997
presently: School of Mines, Nancy, France

Dr. Robert C. Bowman (part-time support 1994-98)
presently: Member Technical Staff, Jet Propulsion Laboratory

Dr. B. V. Ratnakumar (part-time support 1994-98)
presently: Member Technical Staff, Battery Systems Group, Electric Power Systems
Section, Jet Propulsion Laboratory

Dr. Jennifer Dooley (part-time support 1997)
presently: Member of the Technical Staff, Jet Propulsion Laboratory

Dr. Robert McQueeney (part-time support 1998)
presently: Associate Professor of Physics, Iowa State University, Ames.

Dr. Heather Nicole Frase (1998-99)
presently: Technical Staff Member, Institute for Defense Analyses, Alexandria, VA.

Dr. Itzhak Halevy (1999-2000), again (2005-2006)
presently: Physics Department, NRCN, Beer - Sheva, Israel

Dr. Ushma Kriplani (2000-2001)
presently: Postdoctoral Fellow, Argonne National Lab.

Dr. Heike Gabrisch (2000-2003)
presently: Assistant Professor of Chemistry, University of New Orleans.

Dr. Jason Graetz (2003)
presently: Technical Staff Member, Brookhaven National Lab.

Dr. JaeDong Lee (2002-2004)

presently: Staff Member, National Institute for Materials Science, Tsukuba, Japan.

Dr. Anne Dailly (2003-2005)

presently: Technical Staff Member, General Motors Research Lab., Warren, Michigan.

Dr. Tim Kelley (2002-2005)

presently: Technical Staff Member, Los Alamos National Laboratory, NM.

Dr. Rachid Yazami, CNRS, Grenoble, France (2001-2006), again (2009-).

presently: Visiting Associate, California Institute of Technology.

Dr. Doug Abernathy, Argonne National Laboratory, Argonne, IL.

presently: Instrument Scientist, Spallation Neutron Source, Oak Ridge National Lab.,
Oak Ridge, TN.